

THE
BRITISH JOURNAL
OF
CHILDREN'S DISEASES.

VOL. XI.

FEBRUARY, 1914.

No. 122.

Original Articles.

THE FOOD REQUIREMENTS OF INFANTS.*

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THE quantity of food required by infants of different ages and of different weights has not only been determined by the direct calorimetric method, but it has also been empirically estimated by the method of the "test-feed."

The calorimeter method is based on the law of the conservation of energy—that is to say, it is assumed that the energy expended in work, heat-production, and other vital activities is equivalent to the potential energy of the food consumed.

An infant confined in the chamber of a calorimeter is to all intents and purposes an animal at rest. So that, although a considerable amount of energy is expended in the internal work of the body—in carrying on the functions of respiration, circulation, and so on—the whole of it is finally converted into heat in overcoming friction or other resistances, and as such can be estimated by calorimetric methods.

We can therefore make a theoretical calculation of the food

* A lecture delivered to post-graduates, National Association for the Prevention of Infant Mortality and for the Welfare of Infancy, January the 13th, 1913.

requirements of the average baby, by estimating the average amount of heat lost by infants of various ages and of various weights when confined in calorimeters, due allowance, of course, being made for the energy consumed in growth, and stored up in the form of new tissues.

Calculations of this kind have been repeatedly made by competent observers, and, although their results vary* very considerably, they all agree in the very important respect that the heat dissipation, or, in other words, that the food requirement, varies directly with the extent of the skin surface of the baby, and not with the weight or age.

Careful measurements of the superficies of infants of different weights have been made, and it is found that the skin area of a baby weighing 5 kgrm. (11 lb.) measures 350 sq. metres ($3\frac{1}{2}$ sq. ft.), while that of one weighing 10 kgrm. (22 lb.) measures 555 sq. metres ($5\frac{1}{2}$ sq. ft.), and that of a child weighing 40 kgrm. (88 lb.) measures 1442 sq. metres ($14\frac{1}{2}$ sq. ft.).

Therefore the amount of heat lost by children of the respective weights of 5, 10 and 40 kgrm. will stand in the proportion of 350, 555, and 1442, and not in the proportion of 5, 10 and 40, as might naturally be assumed.

The reason why the dissipation of heat is in proportion to the superficial area, and not to the weight, is because the heat is chiefly lost by radiation and conduction from the skin, and the superficies is not proportional to the weight. As a matter of fact, under normal conditions, some 60 per cent. of the total heat dissipated is lost by radiation and conduction, some 35 per cent. by evaporation of water at the surface of the skin and of the lungs, and the remaining 5 per cent. is lost in the urine or in other discharges from the body.

Now, since the quantity of food required by any particular infant is dependent on the amount of heat lost by radiation, conduction and evaporation, and since the amount of this loss is itself dependent on the superficial area of the skin, it is quite easy, provided the amount of heat lost by any one given infant of known weight is known, to calculate from the known data the food requirements of any other infant situated under similar circumstances.

Since we know the average weight of infants of different ages, we also know their average skin surface, consequently we know their average loss of heat, and also their average food requirements.

From these simple data it has been estimated that during the first three months of life an infant requires enough food to supply 99

* Pfaundler and Schlossman, American edition, vol. i, p. 435 (second edition).

calories or units of heat for every kilogramme (2 lb. 3 oz.) of body-weight; a calorie, or unit of heat, being that amount of heat which is required to raise 1 litre (35 oz.) of water through 1° of temperature (Centigrade).

For instance, an infant $2\frac{1}{2}$ months old and weighing 5 kgrm. (11 lb.) will require in the twenty-four hours enough food to produce 495 (99×5) calories. By a similar method of calculation it has been estimated that on an average during the next three months of life infants require the equivalent of 94 calories per kilogramme (2 lb. 3 oz.) of body-weight; or, to take a concrete example, an infant 5 months old and weighing $7\frac{1}{2}$ kgrm. ($16\frac{1}{2}$ lb.) will require a food equivalent of 705 ($94 \times 7\cdot5$) calories. Again, on the same basis, it has been estimated that during the last quarter of the first year of life an infant will require a food equivalent of about 75 calories for every kilogramme (2 lb. 3 oz.) of body-weight.

Now how much milk will infants of different ages and different weights require to afford the necessary number of calories?

The amount of heat or the number of calories afforded by the combustion of milk is not absolutely constant, because the chief heat-producing element in milk, namely fat, is itself liable to variation, but on an average it may be assumed that 1 litre (35 oz., or $1\frac{3}{4}$ pints) affords on combustion 700 calories.

If a more accurate estimation of the caloric value of any particular milk, or milk mixture, is required, it may be made from the following data: 1 grm. (15 gr.) of fat will produce 9·1 calories, 1 grm. of sugar will produce 4·1 calories, and 1 grm. of protein will also afford 4·1 calories.

On the basis of the above data it is quite easy to calculate how much milk of any particular percentage composition babies of different ages will require. Let us take the simple example of an infant three months old weighing 5 kgrm. (11 lb.). In twenty-four hours such a baby will dissipate 495 (99×5) calories in the twenty-four hours.

How much milk will be required to afford this number of calories? If 1 litre (35 oz.) affords 700 calories, by quite a simple sum in proportion it may be shown that 495 calories are afforded by 700 c.c. ($24\frac{1}{2}$ oz.).

Theoretically, therefore, an infant of the above age and weight will require 700 c.c. of milk to compensate for the 495 calories of heat it will lose in the twenty-four hours by radiation, conduction and evaporation, but it will also require a certain additional amount to provide for growth or increment in weight.

On an average a healthy infant of this age will show an increase in weight of nearly 30 grm. (1 oz.) during the twenty-four hours. How much milk will be required to afford material for this growth?

The solid constituents of the baby's body are rather more than twice as much as those of milk, exactly in the proportion of 28·2 to 12, so that assuming that the solids of milk are of the same kind as those of the body, the baby must consume about 60 c.c. (2 oz.) of milk in the twenty-four hours to provide 30 grm. increment in body-weight. This, added to the 700 c.c. required for heat-production, will give a grand total of 760 c.c. (26½ oz.) of milk in the twenty-four hours.

Calculations such as these are extremely valuable in giving us a general conception of the quantitative food requirements of infants, but if we rely too implicitly on them in calculating the dietary of any particular infant we are quite certain to go widely astray. A baby in a calorimeter does not behave as a baby in the nursery; it is situated under strange and unnatural conditions. Indeed, for the most part infants in calorimeters become restless and fretful and cry continuously, thereby wasting much energy, and dissipating a considerable number of units of heat by evaporation of moisture at the lungs' surface. And further, we have no right to assume that under the equable conditions of temperature obtaining in the calorimeter the amount of heat lost by radiation and conduction is the same as that which is lost under the ever-varying conditions of a normal environment.

Then, again, appetite will be influenced by the strange conditions, and a number of other complications will be introduced which must necessarily detract from the accuracy of the calorimeter results. Without entering into further details it is obvious that the conditions which determine food requirements in a calorimeter are not identical with those which determine food requirements in a nursery.

The more recent work of Dr. P. Lavalie* shows how important are considerations of clothing in estimating the amount of heat lost by radiation and conduction; in other words, how enormously an infant's food requirements are modified by its clothes. Dr. Lavalie, using a calorimeter of the D'Arsonval type, experimented with infants wearing different articles of clothing. Leaving the babies in the calorimeter for varying periods of time, he estimated the exact number of calories which were lost by radiation and conduction in accordance with the nature and character of the clothing

* Congrès National des Gouttes de Lait tenu à Fécamp les 26, 27, et 28 Mai, 19'2; Report, p. 79.

worn. He found, for instance, that if an infant wore a simple bonnet which covered the parietal and occipital portions of the head, there was an actual saving in heat expenditure which was equivalent to 65 calories, or to the combustion value of 60 c.c. (2 oz.) of milk. In other words, an infant wearing such a bonnet requires 2 oz. less milk in the twenty-four hours than an infant without such a covering to the head. Further, he estimated by the same method of experimentation that if the legs were protected by suitable stockings an economy of 220 c.c. (6½ oz.) was effected, and that the difference in heat expenditure when woollen and cotton shawls were used was represented by an equivalent 70 c.c. (2½ oz.) of milk.

Such experiments prove how dangerous it is to attempt to apply theoretical principles to the practical management of infants; it is so easy to leave out important factors in the calculation. There can be no doubt at all that the most important factor, in an infant's requirements for food, is the factor of heat dissipation. An infant at rest utilises at least 90 per cent. of its food in maintaining its body temperature at the required level: unlike an adult individual it diverts but little energy into the channels of mechanical work, and, as we now know, although it grows rapidly, the amount of food required for this purpose is only equivalent to the intake in the twenty-four hours of some 60 grm. (2 oz.) of breast-milk. It therefore seems almost unaccountable that in the past the question of clothing and environmental temperature should not have been taken into consideration. A few weeks ago I discussed these matters with a lady who takes a great interest in infant welfare work. "It seems to me," she said, "that it would be of great interest to calculate how many garments a baby would have to wear to enable it to do without any milk at all. I think some of our mothers must unconsciously be trying to solve this problem if we are to judge by the multiplicity of clothes they crowd on the bodies of their unfortunate infants." Such a *reductio ad absurdum*, if properly appreciated, emphasises the important part that clothing plays in the feeding of infants.

I feel sure that it is very necessary to draw attention to this side of the question, for we have only to read the writings of even the greatest authorities on infant feeding to learn how entirely this aspect of dietetics is neglected. Prof. Camerer is probably one of the greatest authorities in the world on the food requirements of infants, but this is what he says in his otherwise most admirable article on "Metabolism and Nutrition" in Pfaundler* and Schloss-

* Second American edition, p. 381, vol. i.

man's text-book on the 'Disease of Children': "The influence of heat and cold can be nearly eliminated by means of clothing and dwellings."

That is to say, Prof. Camerer believes that clothing and housing conditions do not affect the question of food requirements; that in these respects all children are similarly situated, and that their different food requirements depend on other factors.

I would, however, go so far as to say that in estimating the food requirements of any particular infant, the *only* important factor that we need take into account is the varying one of "opportunity for heat dissipation." I do not mean by this that we must not take into consideration such matters as capacity to digest and assimilate food, habit, idiosyncrasies, and so on; all such factors are of the greatest importance. What I mean is this—that, given two infants of equal ages and equal weights and growing at the same rate, and with normal digestive and assimilative functions, their respective food requirements, apart from the very small quantity required for growth and work, will be absolutely dependent on the amount of heat that is lost by radiation, conduction and evaporation of water. To put the case more concisely, I maintain that the different amounts of food these two infants will respectively require will be dependent on the number and thickness of their clothes, on the amount of skin-area (face, head, hands, feet, etc.) exposed to the air, on the temperature of the surroundings, on the degree of humidity of the air, on the ventilation, on the temperature of the bath, and on the number of hours spent in the open air, or in the confinement of the house; that these factors may be entirely different in the two cases and necessitate totally different quantities of food.

I repeat that it gravely misrepresents the case to state that "the influence of heat and cold is eliminated by the means of clothing and dwellings." I admit that the influence of "cold" is almost eliminated in the case of the slum infant, who is wrapped in a multiplicity of garments, sleeps in its mother's arms or in her bed, and is seldom given a bath or taken out of doors, but I submit that therein lies the difference between such an infant's food requirements and that of an infant rationally managed with respect to clothing, housing, exercising, etc.

In the one case there is no opportunity for heat dissipation, and hence there is an extremely restricted demand for heat production, while in the other, although the demands may vary greatly with the circumstances, there is always ample opportunity for loss of heat and always a corresponding demand for food.

Although in the past I have myself been guilty of drawing up many a table of quantities for the feeding of infants of varying ages, I fully admit now that such tables are worthless unless other important considerations such as those of clothing, housing and airing, are simultaneously taken into consideration and allowances made for them.

The second method of estimating the quantitative food requirements of infants, namely the empirical one of calculating the average amount of milk consumed by healthy infants at the breast, has provided us with a large amount of data for drawing up standards for the artificial feeding of infants, but I submit that deductions drawn from these findings are as liable to misconstruction and misrepresentation as are the results of the more scientific calorimetric method.

The amount of food consumed by breast-fed infants has been estimated by the method to which some years ago I ventured to apply the term "test-feed"—that is to say, the infant is weighed on accurate scales before and after feeding; the difference between the two weighings represents the amount of food consumed. By making a number of such estimations, or by estimating the amount consumed at each feeding, certain averages have been arrived at, which are supposed to represent the average requirements of normal infants, and these figures have been indiscriminately applied to the case of all infants no matter what be the circumstances of the hygienic surroundings.

Now the point that I wish to make perfectly plain is this: the observations on which we rely have been made on infants living under the very best hygienic condition; some of them have been the observer's own children, some of them have been infants born and tended in public maternity institutions, where every care and attention have been lavished on the mother, and the standards thus arrived at have been supposed to be applicable to the case of the slum infant, living under the worst possible hygienic condition, and whose mother is probably badly fed or half starved.

A considerable number of figures have been provided by such means, and on the whole I find the standards thus estimated agree very closely with the standards I have myself computed from estimating the amount of breast-milk consumed by the infants of well-to-do mothers in England. On the other hand, until I undertook a long and tedious series of observations on the amount of breast-milk consumed by the average slum infant, we had no criterion whereby to judge how much food such infants actually consumed. It was

taken for granted that they obtained as much milk as the better-conditioned infants on whom observations had actually been made.

During the last eight years I have made a practice of giving each breast-fed infant who is brought to my clinics a "test-feed," or perhaps many "test-feeds." In this way I have accumulated an enormous amount of evidence on the subject.

It is true that I have not been able to make an estimation of all the feeds given in the twenty-four hours in any one particular case. I have had to content myself with estimating the average amount consumed at individual feedings, but all the same I have now made so many estimations at different times of the day that I feel sure that my averages for single feedings, and consequently for the twenty-four hours, are fairly accurate. In estimating the total amount taken in the twenty-four hours from the amount taken at a single feed, one must allow for the total number of feeds and for the fact that the largest feed in the day is usually the first feed (difficult to estimate by the "test-feed"), in the morning after both mother and infant have enjoyed a long rest. Further, one must make some allowance for the fact that in the strange environment of a dispensary or a hospital an infant will not attend to the business of sucking quite as well as in the home. But making allowance for all such sources of error, I find that the average consumption of breast-milk by the slum infant is about 33 per cent. less than the estimates given by German observers for institute infants, or than the estimates I have myself made in the case of infants in well-to-do families.

An examination of the following tables will show how widely my figures differ from the standards arrived at by foreign observers; it will further show how closely they agree with the figures independently arrived at by Dr. Ronald Carter, who carried out a similar series of experiments on the infants attending at his infant consultations in North Kensington.

In the first horizontal column I give my own figures, which refer to "test-feeds" conducted in the case of slum infants attending at my infant consultations in Marylebone. In the second column I give those of Dr. Carter, which apply to a similar class of infant attending at his infant consultations in North Kensington. In the third column I give my own figures for sick infants attending at my out-patient department at the Queen's Hospital for Children, Hackney, a very poor district in the N.E. of London. In the remaining columns will be found the figures supplied by German observers. These refer for the most part to institutional infants, or to their own

children. My figures, as well as those of Dr. Carter, are based on a very large number of observations, whereas those of the German observers depend sometimes on single observations, sometimes on small groups of cases, but in no case on a large number of estimations.

TABLE I.—*Showing the Average Amount of Milk consumed at a Single Test-feed during the Various Ages up to Nine Months according to Different Observers (1906–11).*

		Age.											
		Weeks.			Months.								
		2	3	4	2	3	4	5	6	7	8	9	
Slum infants in London	Marylebone figures	Oz. 1·87	Oz. 1·62	Oz. 1·95	Oz. 2·04	Oz. 2·26	Oz. 2·23	Oz. 3·0	Oz. 2·81	Oz. 3·08	Oz. 2·67	Oz. —	
	Kensington figures	—	1·75	1·85	1·8	2·0	2·15	2·5	2·67	2·72	2·9	3	
	Queen's Hospital												
	figures	—	1·0	1·47	2·0	1·84	1·35	2·18	3·0	2·08	—	—	
Institutional infants or private cases in Germany	Peters' figures	2·4	2·7	2·87	5·42	—	—	—	—	—	—	—	
	Camerer's figures	2½	3½	3½	3½	4½	3½	—	—	—	—	—	
	Beuthner's figures	2	2½	2¾	3¼	4½	4½	5	—	—	—	—	
	Feer's figures	2·5	2·8	3·5	4·0	4·5	4·8	4·8	—	—	—	—	
	Hachner's figures	2½	2½	3	5¼	5½	5¼	5½	5½	7	—	—	

TABLE II.—*Showing the Average Amount of Milk computed to be consumed in the Twenty-four Hours by Infants of Varying Ages (1906–11).*

		Age.									
		Weeks.			Months.						
		2	3	4	2	3	4	5	6	7	8
Slum infants in London	Marylebone figures	Oz. 18·8	Oz. 14·77	Oz. 13·46	Oz. 16·38	Oz. 16·02	Oz. 15·85	Oz. 13	Oz. 18·25	Oz. 20·66	Oz. 12
	Kensington figures	—	16·5	14·5	20	14·5	13·2	17·2	21·5	15·4	26·2
	Queen's Hospital										
	figures	8	—	9·71	18·15	14·3	11·66	9·16	16·25	12	12
Institutional infants or private cases in Germany	Camerer's figures	19	20	28	28	28·25	30·5	33	33·5	—	—
	Feer's figures	17·5	15	20	27·5	26·25	27	28	34	30·5	—
	Beuthner's figures	13	18	19·5	27	28·5	28	—	—	—	—
	Peters' figures	16	17	20	21	—	—	—	—	—	—
	Hachner's figures	15	19	19	28	28	26	30	33	44	—

If we compare these several series of figures, we notice at once that the amount of breast-milk consumed by the slum-infant in London is considerably less than that which is consumed by a better class of German infant.

Take, for instance, the case of the three months old infant in Table II. Slum infants of this age consume, according to my figures, about 16 oz. (480 c.c.) in the twenty-four hours. According to Dr. Carter, such infants consume in Kensington $14\frac{1}{2}$ oz. (435 c.c.), an amount which is exactly the same as the sick infants of this age consume in Hackney. On the other hand, if we refer to the figures given by Camerer, Freer, Beuthner and Hachner, we find that, according to their estimates, infants of this age consume quantities which vary from 26 oz. (780 c.c.) to $28\frac{1}{2}$ oz. (855 c.c.). Feeling that my own figures in these tables were based on too small a number of individual estimations, I have recently repeated my experiments, and have estimated the average amount of all the test-feeds conducted at the St. Marylebone General Dispensary subsequent to the date at which these figures were published.

These figures I give in the following Tables III and IV. I give also the number of actual "test-feeds" on which these estimations are based. These "test-feeds" were given at the St. Marylebone General Dispensary between the dates April, 1911, and September, 1913.

These figures are to my mind extremely interesting, for in each case they show that the infants in my second series (Tables III and IV) obtained more milk than those of my earlier experiments (Tables I and II). The increase is so constant and uniform that I cannot assign it to any other cause than that, owing to my experience with the "test-feed," and to the lessons that I have derived therefrom, I have been more successful of late years in overcoming the difficulties connected with the management of lactation, and because I have exercised more care in creating a greater demand for food on the part of the infant by modifications in the clothing and in other hygienic conditions.

But from whatever point of view these figures are regarded they afford ample material for reflection. For instance, if we are faced with the duty of determining how much food an artificially fed infant is to receive, shall we be better advised in following the standards afforded us by the German observers, or by taking our cue from the exiguous breast allowances consumed by the slum-infant according to my own tables? This depends, I believe, on the hygienic surroundings of the child.

TABLE III.—*Average Amount of Breast-milk consumed at a Single Feed by Slum-infants in Marylebone (between April, 1911, and September, 1913).*

	Age in months.							
	1	2	3	4	5	6	7	8
Quantity of milk consumed .	Oz. 1·94	Oz. 2·50	Oz. 2·75	Oz. 2·37	Oz. 3·37	Oz. 3·37	Oz. 2·56	Oz. 2·50
Number of estimations on which figures are based	60	43	20	20	10	8	4	2

TABLE IV.—*Average Amount of Breast-milk computed to be consumed during the Twenty-four Hours by Slum-infants in Marylebone (April, 1911, to September, 1913).*

	Age in months.							
	1	2	3	4	5	6	7	8
Quantity of milk consumed .	Oz. 17·36	Oz. 20·68	Oz. 18·20	Oz. 18·20	Oz. 22·40	Oz. 20·30	Oz. 18·21	Oz. 17·72

Here in London we know that the mortality from diarrhœa and wasting diseases is on the whole much greater among the artificially fed than among those fed at the breast. If slum breast-fed infants suffer from any high degree of relative starvation, how is it that their mortality-rate is so low, and why is it so high among the artificially fed infants, who receive a very much larger amount of food? That the latter do receive a much larger quantity is known to everybody with any experience of the methods of artificial feeding indulged in by the poor mothers of London.

I am quite sure that on an average the artificially fed slum-infant receives 30 to 60 per cent. more food, estimated according to its caloric value, than does the breast-fed infant of the same age.

Now my more recent statistics in Marylebone prove that of the infants attending regularly at my infant consultations, those who are artificially fed show a slightly lower proportion of cases of diarrhœa and malnutrition than those who are breast-fed. I attribute this result entirely to the fact that my long experience with the test-feed

has taught me that the average slum infant requires very small quantities of food, and that on small quantities of food, if the latter is quantitatively adjusted to the physiological needs, the slum-infant can fare extremely well.

As I have already explained, the quantity of food required by the infant is determined by three factors: (1) the rate of growth, (2) the mechanical work done, and (3) the quantity of heat required to maintain the bodily temperature. The first two factors are almost negligible, so that for all practical purposes the amount of food an infant requires to meet its physiological needs resolves itself into the question, "How much heat does it lose by radiation, conduction and evaporation of water?"

The slum-infant is, as a rule, enveloped in many more thicknesses of clothing than the well-to-do baby, it is kept in hot, ill-ventilated rooms, and, in fact, is deprived of all those essential stimulants which create a demand for food. I feel convinced, therefore, that Nature, in supplying such slum-infants with a very restricted allowance of breast-milk, is wiser than we are when we feed them artificially on rations, which are physiologically adjusted to infants with greater food requirements, with a more active metabolism, and with better opportunities for dissipating heat.

I hope I shall not be misunderstood when I say that the ordinary slum-infant, if artificially fed, should be fed on a very restricted dietary. I do not approve of starvation in any form. I never rest content until the infants for whose health I am in any way responsible manifest a demand for larger allowances of food. A greater demand is created by less clothing, by more air, by more sun, by more exercise, and by a more liberal supply of all those stimuli which quicken the vital processes. With a greater demand for food there should be a correspondingly greater supply, but to give increased quantities of food before there is a physiological requirement for it is to court disaster. Indeed, the human body positively bristles with mechanisms which protect it against the pathological consequences of excessive feeding; some of these effect their object at very little expense to the comfort and well-being of the individual, others entail considerable strain.

The simplest method of counteracting the dangers due to excessive feeding is that of storing up the excess in some form available for future use. Carbohydrates and fats can be most conveniently and safely stored up in the form of reserves of glycogen and fat; on the other hand, there is no natural provision for the storage of reserves of nitrogenous or proteid foods; such supplies must be put

to immediate physiological use, or expelled from the body. Such expulsion clearly entails expenditure of energy as well as wear and tear to the eliminating organs.

Next to storage, increased combustion is the readiest means of defence against the excessive consumption of food, and this method of disposal applies to all classes of food. In order that there may be an active combustion it is essential that the supply of oxygen should be ample, and that the metabolic processes should be maintained at a high level. When such is the case all varieties of food are oxidised or reduced to their normal end-products, carbonic acid, water and urea, with the production of a corresponding quantity of heat. On the other hand, if there is curtailment in the supply of oxygen, there may be a short-circuiting of these processes, and in such circumstances the oxidation is incomplete, the heat produced less, and a number of intermediate bodies, such as fatty acids, are formed which dispose to a condition of acidosis with all its attendant evils. Subsidiary lines of defence consist in loss of appetite, diarrhoea, vomiting, catarrh and mucous discharges, all of which are designed to preserve the life of the individual as a whole, though they may inflict damage on certain of its parts.

When any one of these protective mechanisms is brought into play, evidence is afforded by the fact; in other words, pathological symptoms are produced, some of which may be so trivial as to escape observation, while others may be so obtrusive as to attract the attention of the most dull-witted observer.

An abnormal increase in weight, say of 10 to 14 oz. per week, in a baby under a year old, if maintained for any prolonged period of time, should at once suggest that the storage resources of the body are being over-strained, and such an event should lead us to expect that when the critical limit is reached, resort will be made to inner lines of defence, with possibly more serious consequences to the individual as a whole.

Again, if the capillaries of the cheeks are dilated, if there is sweating about the head, and if the respiration-rate is unduly raised, we are entitled to suspect, in the absence of a better explanation, that reserve methods of heat-dissipation are being called into requisition. Then, if we are wise, we shall take steps to ensure that worse things do not befall the child. We should, in fact, curtail the supply, or increase the demand for food.

It is clearly the duty of the physician to exercise the greatest vigilance in the detection of these early symptoms, but it is very difficult to convince the lay mind that rosy cheeks and a fine weight

record can be of unfavourable augury. It is a matter of almost daily experience for me to find that attacks of bronchitis, diarrhoea, or intestinal toxæmia have been preceded by prolonged periods of apparently exuberant health.

One of the great arts in infant management is to proceed slowly; the young child cannot develop indefinitely fast: "*festina lente*" should be the guiding principle.

I cannot help feeling that in this account of the food requirements of infants I have destructively criticised many of our best-cherished beliefs without replacing them by any practical substitutes. It is all very well to say that artificially fed slum-infants are more often overfed than not, but it is quite a different story to define in what an optimum dietary for such infants really consists. Hedging myself in with all possible reservations, and with full knowledge of the scientific worthlessness of any such estimates, I am prepared to venture the statement that no infant, breast-fed or artificially fed, can be considered to be in a satisfactory condition unless its physiological demand for food is of the following approximate standard. An infant 3 months old and weighing 5 kgrm. (11 lb.) should not require less than 690 c.c. (23 oz.) of breast-milk, or its equivalent, in the twenty-four hours; an infant 6 months old and weighing 7.5 kgrm. (16½ lb.) should not require less than 900 c.c. (30 oz.); and an infant 9 months of age should require not less than 1080 c.c. (36 oz.). If, when taking food in these quantities, there is evidence, by reason of the development of any of the symptoms already mentioned, that there is an excessive intake, I would advise that steps be taken to increase the demand for food by a revision of the hygienic management of the child. As I have already stated, a demand is created when the appropriate stimuli of air, light, and cold are applied.

HÆMORRHAGIC AND GANGRENOUS VARICELLA, WITH NOTES OF TWO CASES.*

By H. C. STORRIE, M.D.Glas.,

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UNTIL comparatively recent times varicella was regarded as a most benign disease; many still believe it to be a trivial condition, but recent writings have shown that several more or less severe com-

* Abstract of a thesis for the M.D. degree, Glasgow.

plications may occur even in an apparently mild attack in a healthy individual. In view of the occurrence of fatal cases from nephritis, septicæmia and pyæmia, severe inflammatory eye conditions and gangrenous and hæmorrhagic forms, varicella ought now to be regarded as a somewhat more serious disease and given more consideration, especially when it occurs in patients who, for some reason or other, are predisposed to a severe attack or any of these complications. The association of tuberculosis and gangrenous varicella has occupied the attention of several writers but so far the question has not been settled. There seems to be no doubt that in many cases there is some association. Several cases have been reported in which death from tuberculosis occurred soon after an attack of varicella, and many cases of gangrenous varicella have occurred in tuberculous children.

Reference to the literature shows that complications of varicella are few in number and rare in occurrence. Kieffer in 1905 was able to collect only forty-three cases of gangrenous varicella; of these, twenty-nine died, so that a fatal issue is not so uncommon as many writers are inclined to believe. Many of these deaths Kieffer thought were due to tuberculosis.

The greater number of gangrenous varicella cases that have been described have presented multiple gangrenous lesions; there are very few in which one large lesion was present, while there are only some ten or twelve true cases of the hæmorrhagic type on record. Many gangrenous cases have presented a hæmorrhagic stage, while many cases which at first appeared to be hæmorrhagic became gangrenous later on. The two forms may therefore be considered together under one heading. Both of the cases described here presented one large extensive gangrenous lesion at first, while the second one showed a hæmorrhagic stage before gangrene occurred. Both cases occurred in patients convalescing from scarlet fever in a ward which had become cross-infected by a patient who was admitted with scarlet fever and incubating varicella. The two cases occurred within ten days of one another.

CASE 1.—On December the 3rd, 1912, a healthy, well-nourished boy, aged 6 years, was admitted to hospital suffering from scarlet fever.

On January the 2nd, 1913, he developed varicella, of which there had been a previous case in the ward on December the 17th; fresh vesicles appeared for three days but the rash was not copious. There was nothing in his condition to attract attention until the morning of January the 5th, when his temperature rose to 101° F. He felt well;

a few pustules were present. He had been using his fingers to allay irritation in his nostrils and had been scratching his skin in several places.

Towards evening the temperature rose, and at eight and twelve o'clock was 103° F. The pulse was frequent, 144, and of good quality, he had slight headache. During the night he was somewhat restless. The next morning a patch of redness was discovered over and below the middle of the left clavicle about the size of a crown piece. In this area were two pustules about an inch and a half apart.

He was now much more acutely ill. He had headache, but no vomiting; the breath was foul; the tongue was thickly furred—previously it had been clean—and there was considerable faucial injection and swelling of the tonsil. He was very fretful; he lay in bed slightly on his left side and with his head inclined to the left—an attitude not unlike that adopted by a person who has a fractured clavicle. Any movement of the head, arms or trunk caused him to cry out. The patch of redness increased rapidly, and in four hours had spread right over the left shoulder, downwards on the chest-wall to the level of the fifth rib, and across the chest and front of the lower part of the neck on to the anterior aspect of the right shoulder. The reddened area of skin was swollen, but not glazed at all, and the spreading margin fairly well marked. Marked cutaneous tenderness was present, making it difficult to palpate, but, judging from the amount of swelling, the subcutaneous tissues seemed to be involved as well. The swelling immediately above the manubrium was very soft and puffy. One pustule was present immediately over the middle of the clavicle, while the other was lower down and nearer the middle line. Before this condition occurred there had been no redness or swelling round these pustules to indicate that any inflammatory process was going on.

Fomentations of 1 in 40 carbolic acid were applied to the part every three hours; fluids only were given by mouth; one grain of calomel with thirty of jalap powder was administered.

During the day the temperature continued to rise, and in the evening was 104.8° F.; tepid sponging reduced this to 101.2° F. He was very restless during the night. Next day the redness had spread still further, but much less rapidly; the parts were more swollen, but no fluctuation was made out.

Constitutional disturbance was now much more evident. He presented the appearance characteristic of a severe toxæmia. The temperature continued to run about 104° F., and thirst was marked.

As the bowels had not moved, castor-oil was given by mouth, and a soap-and-water enema given. A copious evacuation seemed to relieve him considerably.

During the next twenty-four hours his condition did not alter materially. The inflammation had increased, but there was no sign of free fluid. Boracic acid fomentations were at this period substituted for the carbolic acid ones. Although the face was flushed, there had been no tendency for the redness to spread to the scalp or face.

The child was by this time so acutely ill that it was deemed necessary to make exploratory incisions. Under light chloroform anæsthesia the two pustules were lightly scraped with a small blunt spoon. The lower one was quite superficial, but the upper one had evidently perforated the whole thickness of the skin, as, after scraping it, a distinct circular aperture about an eighth of an inch in diameter was visible. A small probe passed through this aperture could be moved freely in all directions for a considerable distance under the skin. The aperture was distinctly punched out in appearance, and from it, on pressure, there exuded small quantities of thin, watery, purulent fluid.

A large free incision was made from above downwards into the subcutaneous tissues; smaller incisions were made on each side of this. Small amounts of thin, watery, purulent fluid came away from several small pockets in the cellular tissues—not from a general cavity. The incisions showed the cellular tissues to be in a complete state of sloughing; a large yellowish slough appeared in the bottom of the wound. No muscle was visible. The incisions did not by any means reach to the edges of the affected area; they were made, however, large enough to secure adequate drainage of the parts, which appeared as though more sloughing might occur.

A large 1 in 40 carbolic fomentation was applied, and allowed to remain on for eight hours, at the end of which time it was found that about a square inch of skin, bounded on three sides by the incisions, had become black. A boracic acid fomentation was then applied for six hours; no further discoloration had occurred, however, when it was next dressed.

Next day the edges of the wound had retracted considerably, exposing the slough more. Dressings were now applied three-hourly, and consisted of lint wrung out of hot normal saline solution and then dipped in a solution of 10 per cent. ichthyol in glycerine.

The boy's condition was evidently much relieved by the operation, but the redness again began to spread over the left shoulder and into the left axilla and over the deltoid region.

On the following day the wound looked very ugly indeed, so much had the free edges receded. The yellowish slough had become blackish in parts, but no more discoloration of the skin had occurred. The wound was 4 in. long, and at its upper and lower parts $2\frac{1}{4}$ in. and $3\frac{1}{2}$ in. broad.

Although the edges of the wound remained reddened and undermined, it soon began to heal; the slough separated rapidly, exposing muscle; there was no excess of discharge—this had all along been quite sweet. On the fourth day after the operation the wound had changed considerably. The redness was limited to a margin of one to two inches all round, there was less undermining of skin, and the slough had separated, leaving a healthy granulating surface. Fibres of the platysma myoides, pectoralis major and other smaller muscles were visible. There was a little tenderness, but movement was free; the edges had receded so much that the outline of the outer three fourths of the clavicle was distinct at the bottom of the wound. Hydrogen peroxide and saline solution were used to clean the wound, while the dressing now consisted of lint wrung out of saline solution.

On the 22nd, fourteen days after operation, the boy's condition was quite satisfactory. The wound was healing quickly, and had become quite like a maple-leaf in shape. The whole outline of the clavicle was now visible; this was due to excessive retraction of the edges at the lower and innermost end of the wound. The loss of the subcutaneous tissues had made no appreciable difference in the outline of the parts. Red lotion dressings were used now night and morning only.

On the 29th a blotchy erythematous rash appeared all over his body, and persisted for several hours. This rash was very indefinite in nature, and was probably due to absorption of the red lotion, which was stopped, and normal saline used again.

He was allowed up with the arm bandaged across the chest, but on February the 3rd he developed a subacute attack of rheumatism. Both tonsils were inflamed and had large deposits. Four separate cultures showed a mixed streptococcal and staphylococcal infection. The attack of rheumatism yielded to salicylate treatment in a few days, but the throat did not clear up until February the 12th. The wound was not affected in any way.

The wound did not finally heal up until March the 20th. The recovery was in every way very satisfactory.

Cultures from the wound gave a pure growth of *Staphylococcus pyogenes aureus*.

Fig. 1 shows the parts two days after the operation.

There seems to be no reason to doubt that the case was one of the severest types of gangrenous varicella. The upper vesicle had become infected with a particularly virulent staphylococcus. The secondary infection had been so acute as to cause a gangrenous perforation of

FIG. 1.



the skin in the base of the vesicle. Once in the loose cellular tissues, the organisms continued their destructive work, and caused fairly extensive necrosis. At first one was inclined to ask if the condition was diphtheritic, particularly as there had been much scratching.

Free incisions, so as to allow of free drainage, and the frequent use of mild antiseptics are points to be noted in the treatment.

CASE 2.—A well-nourished healthy boy, aged 4 years, was admitted to hospital on November the 24th, 1912, suffering from scarlet fever. The attack was comparatively mild; there was very

little desquamation and no complications occurred. He was allowed up on December the 14th. Being in the same ward with Case 1, he was, of course, under special observation.

On January the 13th he developed chickenpox. The attack seemed to be fairly mild at first and the rash was not copious, but on the fourth day his temperature was 99° F., a punctate erythematous rash appeared suddenly all over, he had stomatitis, and the fauces became very red. There were a few pustules present now. The boy was distinctly ill. Next day the rash had completely disappeared and his general condition seemed better. At four o'clock on the following morning he was very flushed, looked ill, and had a temperature of 101.4° . Three hours later a patch of redness was noticed, about the size of the palm of the adult hand, on the posterior aspect of the right thigh. This redness had appeared suddenly and spread rapidly, as in five hours' time it was three times as large. A small septic focus appeared on the left thumb at the same time. He was now acutely ill, he had headache and was very pale. The temperature continued to rise, the pulse became frequent, 156, and thready; thirst was excessive and he lay on his back in bed.

The affected area soon became much swollen and indurated and very tender to touch, the spreading edges were rather indefinite. When first observed there were no vesicles or pustules in the patch of redness, but right in the centre of it there was a small pin-head-sized papule. The patch in its rapid spread, however, soon involved on the inner aspect of the thigh a vesicle which was crusted and quite black in colour. Before this patch appeared there had been no signs of any inflammatory change round any of the vesicles or pustules.

Fomentations wrung out of normal saline solution and 10 per cent. ichthyol in glycerine were at once applied to the part and changed every three hours. During the afternoon the punctate erythematous rash appeared again. Towards evening the boy's condition became distinctly worse; the redness, now extended from hip to knee; there was much more involvement of the inner aspect of the thigh than of the outer. The parts had become much more swollen, and although they looked tense they were really soft to palpate and pitted on pressure in places. In the centre of the patch, where the redness had first appeared, there was an area of skin, about the size of a penny, which was bluish-black in colour. He was now inclined to lie on his right side with both the knee and hip flexed. Any movement caused him to cry out with pain. The constitutional disturbance was well marked; the pulse was 160, the temperature 104.2° F., he had vomited and become very restless and fretful.

During the night he was restless and had no sleep. In the morning he looked very ill, the pulse was of worse quality and the temperature 102° F. The parts were more swollen; the redness had spread further, and now involved the scrotum and the left thigh at the gluteal fold. The bluish-black area on the thigh noticed on the previous evening now measured $3\frac{1}{2}$ in. in length and $6\frac{1}{4}$ in. in breadth, so that it had increased rapidly. In this area were three small bullæ, from which, on puncture, came watery sanious fluid. Much of the swelling of the thigh was due to œdema on the posterior aspect, chiefly on its upper part.

Under light chloroform anæsthesia during the afternoon five exploratory incisions were made on the posterior and inner sides of the thigh; there was a free flow of watery sanious fluid, the subcutaneous tissues were dark yellow in colour, but there was no evidence of pus or sloughing. Section of the skin showed the discoloration to be hæmorrhagic. Saline solution fomentations were applied every three hours. The subcutaneous tissues at night looked as though they were going to slough and there was a free flow of blood-stained fluid. The discoloured area, now quite black, had spread upwards and outwards towards the groin from the inner side of the thigh as a narrow strip, about an inch and a half broad.

Vomiting became more persistent; he was very restless and cried out frequently for drinks. The pulse was of such poor quality that three-minim doses of liquor strychninæ were given three-hourly by mouth. During the night he was very restless and had no sleep; at eight o'clock in the morning he had a rigor which lasted five minutes. The discoloured area on the thigh had spread still further and had become quite gangrenous.

The colour was bad and the skin generally cyanosed. The pulse was so weak as to be uncountable, the left side of the face was twitching frequently, vomiting was persistent. At this period he appeared to be dying. During the afternoon he was given a mixture containing hydrocyanic acid, magnesium carbonate, sodium bicarbonate and tincture of digitalis. Towards evening the vomiting ceased, and the colour and pulse improved. The scrotum had by now become much swollen and discoloured, and the superficial layers of the skin over the gangrenous area were commencing to peel in large pieces. During the night the patient slept about three hours. When the wound was dressed it was seen that the area of gangrene had become larger, and that two small bullæ had appeared on the scrotum. The gangrenous parts kept moist, but were now becoming a dull greyish colour, and, except at the scrotum, showed a fairly

definite separation edge. Much difficulty was experienced in dressing the parts at this period on account of the position of the leg and the tenderness. A solution of sodium citrate and chloride was used as a fomentation now. During the day his general condition improved slightly, but the swelling of the scrotum began to spread on to the lower part of the abdomen.

January the 23rd: The thigh now presented a large dull, greyish-white, moist, shrivelling area of gangrenous skin, extending from below Poupart's ligament in front round the inner aspect of the thigh to the posterior side, most of which was involved. A definite separation edge was present round the gangrenous portion of the scrotum. The parts beyond the gangrenous area were becoming less red and swollen, and there was some undermining at the separation edge all round.

Patient's condition had become more satisfactory; the temperature was 98-99° F., and the pulse 140-144; all over the body there were traces of the punctate rash and a degree of cyanosis. Twitchings were still visible; the vomiting had ceased, and he had enjoyed several hours' sleep. The stools were greenish in colour and a trace of albumin had appeared. The gastric mixture was stopped.

At 4 o'clock on the morning of the 24th he complained of pain in his left axilla, and three hours later cried out with pain when the left elbow was moved. Later on in the morning he became flushed, both pulse and temperature rose, and he vomited again. The gangrenous areas on the thigh and scrotum had separated more; there was now some fœtor, so iodoform powder was dusted all over the parts. It was impossible to tell at this period to what extent the subcutaneous tissues were going to separate. There was no apparent cause for the pain in the axilla, but the left elbow-joint was slightly but distinctly swollen all round. No crepitations were elicited, but there was a small faintly discoloured and tender area of skin behind and on the same level as the external condyle of the humerus. Movements, especially supination, made him cry out with pain. Boracic fomentations were applied to the elbow-joint every three hours. During the night he slept some six hours and only vomited once; at 6 o'clock in the morning he complained of pain in the right elbow. The sloughing parts continued to separate fairly quickly; no more iodoform was used, however, as there seemed to be too great a risk of absorption from the extensive raw surface. The left elbow was less painful to touch and on movement; the right, however, had become swollen and painful, and over the head of the radius there was marked tenderness and a faint discoloration

of the skin. Fomentations were applied here also. He vomited several times in the course of the day and his temperature rose to 104.4° F. The gastric mixture was given again.

Although he slept some five hours during the night he was restless and was mildly delirious at intervals. Early in the forenoon a rapid

FIG. 2.



change occurred. Vomiting became persistent, his colour got bad and his face pinched; the tongue became dry and the breath fruity. The vomit on several occasions consisted of small quantities of chocolate-coloured mucus; at other times it was greenish. Delirium became more marked.

The sloughs had separated still further and almost two inches of the adductor longus muscle were now exposed, and there was considerable undermining of the skin at the separation edge in the perinaeal region. There had been considerable retraction of the skin on the outer aspect of the thigh. There was no appreciable change in the elbow-joints.

Towards evening he went downhill rapidly; he wandered considerably, the temperature rose to $105\cdot8^{\circ}$ F., and the pulse became imperceptible. There seemed to be tenderness over the left patella and the joint was painful to move, but there was no swelling or discoloration.

He gradually became comatose and died at 5 o'clock in the morning of the 27th. There was no further increase in the amount of albumin. Unfortunately an autopsy was not allowed.

The history of the patient was rather interesting. He weighed $9\frac{3}{4}$ lb. when born and for six months thrived, and then suffered acutely from wasting disease for several weeks during which time he was not expected to live. Since then he had been healthy. Three months before he took scarlet fever his doctor treated him for a boil on the thigh. This seems to have been in the spot where the gangrenous lesion first appeared. There was no family history of tubercle or syphilis and the boy himself was quite healthy.

Cultures from the wound showed numerous groups of *Staphylococcus aureus* and a few streptococci. The photograph (Fig. 2) was taken immediately before the exploratory incisions were made. This case appears to have been a more severe one than Case 1. The pin-head-sized papule visible in the centre of the red patch at first appeared to be either an aborted vesicle or one which got very early secondarily infected. The infection was so acute as to produce a hæmorrhagic condition before gangrene set in. The occurrence of joint complications seemed to indicate a septicæmic or pyæmic condition.

Since the subject of gangrenous varicella was first described by Jonathan Hutchinson in 1880 comparatively little has been added to it. Most of the cases described about that period presented multiple cutaneous lesions and occurred chiefly in badly nourished or tuberculous children. Hutchinson and Stokes were the only two observers who found such cases in healthy children and believed such an occurrence was due to an idiosyncrasy. All the other writers, including Crocker, Barlow, Fagge, Abercrombie, Payne, Ashby and Wright, were inclined to believe that gangrene occurred in tuberculous children, and were almost but not quite convinced that tubercle was the most common cause. Barlow found tuberculous lesions in six out of eight autopsies; Abercrombie's case showed tuberculous abdominal foci; Payne's case died of acute miliary tuberculosis, as did that described by Ashby and Wright, two months after an attack of varicella.

In the later cases we do not hear so much about tuberculosis in association with gangrenous varicella, although most writers make

some reference to it. Probably a much more common cause of gangrene occurring in varicella is the recent occurrence of one of the other fevers. Jamieson's case followed soon after measles and whooping-cough; Staniforth's four months after measles; Griffith's after pneumonia, diphtheritic tonsillitis and measles; Alexander's during convalescence of whooping-cough and broncho-pneumonia, while several have occurred in convalescent scarlet fever cases. Other cases have followed debilitating illnesses—thus Silver's case succeeded an attack of gastro-enteritis during a very hot summer.

Many of the cases, however, have occurred in healthy children, and the more recent writings strengthen Hutchinson's views on that point.

The first case described, in which large gangrenous lesions were found, was that mentioned by Bellamy; here several large areas were involved both on the legs and arms. The gangrenous stage occurred after a well-marked hæmorrhagic stage. Spivak first described a case in which only one extensive area was involved; it was also the first case in which the scrotum was involved. There were two extensive lesions in Turner's case, while in Rolleston's case there was one comparatively large gangrenous patch on the eyelid, and in Watson's one area involved the inguinal region and the scrotum. All of these cases occurred in healthy patients.

Three classes of cases have been described of the gangrenous form of varicella: the first in which superficial ecthymatous sores appear, the second to which Hutchinson gave the name "varicella gangrenosa," and the third where single and extensive lesions are found. The first and second types are probably found more frequently in unhealthy children, and there is no doubt that ill-health has much to do with the occurrence of gangrene, but in the third type there seems to be a different condition altogether both clinically and pathologically. In this class one usually finds a single, more or less extensive lesion, with gangrene of the skin, subcutaneous tissues and deep fascia, so that frequently the deep-lying tissues—periosteum, muscle and glands—are exposed. Constitutional symptoms are as a rule severe, and fatal results are common from septicæmia and pyæmia. These cases occur, as a rule, in previously healthy children and over three years of age. Gangrene may occur at any time during the illness, but usually in the first days, and the process is invariably acute. The stage of gangrene in some of these cases has been preceded by a hæmorrhagic condition; this may be taken as evidence of the severity of the infection. It might, however, be evidence of a close pathological association between the hæmorrhagic and the gangrenous forms.

The diagnosis of such cases ought not to cause any trouble. The prognosis in the hæmorrhagic cases should always be guarded, while in the gangrenous forms it depends more or less on the age, number and degree of severity of the lesions, the amount of constitutional disturbance, and the presence of tuberculous or pyæmic lesions.

Treatment should chiefly aim at placing these patients under the simplest but most efficient dietetic, antiseptic and hygienic conditions.

Local treatment consists of boracic acid baths or fomentations, ichthyol as an ointment or as a 10 per cent. glycerinated solution, carbolic oil, nitrate of mercury and boracic acid ointments, perchloride of mercury solution 1–2000 to 5000, and various dusting powders. Normal saline solution frequently used is probably one of the best local applications.

The local conditions are often prevented from healing and new lesions caused by scratching, so that it is necessary in some cases to use cardboard splints and gloves in addition to keeping the nails short and clean. In the less severe forms most of the cases are best treated by good nursing and keeping the parts clean.

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A CASE OF PURPURA OF UNKNOWN ORIGIN WITH RAPIDLY FATAL TERMINATION.

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ALTHOUGH I am heading this note “Purpura,” I am using that term in a general way and merely to indicate a symptom—viz. hæmorrhages into the skin. The case is an incomplete one, I admit, as a necropsy was not allowed. Notwithstanding, I am of opinion that it is worth recording.

The patient was a little girl, aged 9 years, who was brought to my out-patients’ on account of spots about the legs. These, on investigation, turned out to be hæmorrhagic. I pointed out at the time to the graduates attending the clinic how important it was in such cases to keep the patient under observation, and that the first thing to do was to order the patient to bed. Though the cutaneous lesions were not very formidable, and the patient, as in this instance, appeared to be well otherwise, one could never tell what the upshot might be, especially as regards the viscera. I insisted on the necessity of examining the throat, a thing which should be done in a routine way in children, for diphtheria, etc. Further, the urine and stools should be examined for any evidence of blood. I pointed out, too, that the skin condition was a danger signal, a symptom only of trouble, which might be remote or secluded. I therefore admitted the child for further observation and investigation. As the case was a general one, Dr. Sydney Owen was good enough to examine the child thoroughly and take charge of it. I desire to express my thanks to him for allowing me to make use of his notes. I am also indebted to Mr. Hammond, the House-Physician, for his assistance in keeping a record.

The following notes were made :

76 CASE OF PURPURA OF UNKNOWN ORIGIN.

On July the 23rd, 1913, Elsie B—, aged 9 years, was admitted to Hull Ward, under Dr. Pernet, with hæmorrhagic patches in the skin, and then transferred to Dr. Sydney Owen.

She had been quite well until three weeks previously, when she complained of aching all over, and her ankles and knees became swollen. Later the elbows became involved. This swelling had disappeared.

A fortnight previously blotches appeared on the legs. Gradually she got worse, and was brought up to out-patients' skin department. No vomiting, no cough, bowels open each day. Measles two years ago.

Mother has rheumatism.

Patient appears quite healthy, cheeks being of a rosy colour. No purpura of face. Temperature and pulse normal. *Eyes*.—Conjunctivæ are normal. *Mouth and buccal mucous membranes*.—Tongue a little furred. No ulceration. *Fauces*.—Tonsils slightly enlarged. No redness. *Neck*.—No enlarged glands. No purpuric eruption. *Chest*.—Apex-beat fifth space, internal to nipple line. No cardiac murmur. *Lungs*.—Normal. No evidence of tuberculosis. *Abdomen*.—No purpuric eruption. Slight distension. No tenderness.

Extremities: *Arms*.—Nothing abnormal.

Legs.—A purpuric eruption, consisting of patches varying from $\frac{1}{4}$ to $\frac{3}{4}$ in. in diameter, are present below the knee, chiefly on the front of the leg. The thighs are not involved.

There are no swelling, pain or tenderness of any of the joints.

No enlarged glands are present about the body.

The purpuric eruption appears less intense than when child was seen in the out-patient department. It has a less purplish and a more yellowish appearance.

Urine.—No blood. No albumin. No pus.

July the 24th: Child appeared quite healthy this morning. She complained of slight tenderness over both knees and ankles.

The purpuric eruption is more yellow in colour to-day than yesterday. No fresh patches.

Child complained of slight pain in right iliac fossa this evening. Slight tenderness. No rigidity. She vomited twice, vomit consisting of contents of stomach. No blood in vomit.

Bowels open well; no melæna. Pulse and temperature normal. Urine normal.

July the 25th: This morning child's condition is a little worse. She has vomited twice since last night, vomit being of a yellowish colour and watery in consistence. No blood in vomit. She appears to have a slightly anxious appearance. Abdominal pain disappeared. No tenderness.

Rectal examination.—No tenderness. No fulness. Pain in joints has disappeared. Urine normal. Pulse 90. Temperature normal.

Evening.—Child has vomited three times since this morning. Her appearance gives cause for alarm. The pulse is 108 (when admitted 80) and temperature 99° F.

Bowels not open. No blood in vomit, which is of a yellowish colour and has no distinct smell.

The breath has an acetone odour and free aceto-acetic acid is present in urine. No sugar, blood or albumin is present.

July the 26th: Vomiting has continued during the night.

The pulse has risen to 112. Temperature 98.4° F.

The child's condition is much more serious, the face having a much more shrunken appearance.

The child is quite conscious, and complains of no pain except slight headache. She answers questions quite intelligently.

The vomit is bilious in character, not offensive, and acid in reaction. A fresh

purpuric eruption, consisting of patches varying from 1 mm. to 5 mm. in diameter, has appeared over left deltoid region. The eruption over the legs is less intense.

No cardiac murmurs are audible, and the pulse, though more rapid, is regular (118).

Abdomen is retracted; no tenderness, no rigidity.

As the bowels have not been opened an enema was given this evening. The result was slight and of constipated character, but no blood was present.

Optic discs are normal; no head-retraction and no abnormality in reflexes.

Temperature in the evening went up to 99° F.

Urine still gives aceto-acetic reaction, but neither blood nor albumin are present.

July the 27th: Vomiting has continued during the night, but remains of same character. Bowels not open. No rigidity. Abdomen slightly retracted. Urine same as yesterday. No fresh purpuric eruptions have appeared.

The temperature this evening went up to 100.5° F.

Dr. Elworthy, Pathologist to the Hospital, reports as follows:

Leucocyte count, 12,800; polymorphonuclears, 75 per cent.; coarse, 0 per cent.; mononuclear hyaline, 0 per cent.; large lymphocytes, 12.5 per cent.; small, 8.5 per cent.; transitional, 4 per cent.

Child has only vomited once since last night, and appears much more comfortable. She only vomited once during the day, and appeared more comfortable. At 12 at night her condition was much improved, and it seemed as if she would pull through. She slept until 2 a.m., when her pulse became irregular. Strychnine was given. At 3 a.m. her temperature went up to 104.5° F., and half an hour later she became unconscious. She remained in this condition for half an hour and died.

No post-mortem was allowed.

Treatment, which was necessarily empirical and symptomatic, consisted chiefly in rectal and subcutaneous salines (with glucose) and injections of strychnine and adrenalin. Horse-serum (5 c.c.) and antistreptococcal serum (5 c.c.) were also tried.

I may add that a surgical opinion was obtained, but Mr. O. L. Addison, who examined the case, could not put his finger on anything in that direction which might have helped us.

The Royal Society of Medicine.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

Friday, November the 28th, 1913.

The President, DR. LEONARD GUTHRIE, in the Chair.

Recrudescence of Rickets with Tuberculosis and Infantilism.—Dr. C. E. ZUNDEL.—Former hospital records showed that the patient, a boy, now aged 14 years, was at the age of seven years treated as an out-patient and then as an in-patient. At that time he was described as very undersized and with marked rickets. At the age of eleven years he was admitted to hospital with

marked ascites, the abdomen being tapped six times in nine months. When he came under observation in June, 1913, his height was 3 ft. 4 in. and weight 2 st. 11 lb. Marked deformities of the forearms were present, due to recent fractures. There were some broncho-pneumonia and considerable ascites. Wassermann's reaction negative.

Bilateral Congenital Dislocation of the Hip in Twins.—Dr. F. G. CROOKSHANK and Mr. L. E. C. NORBURY.—The patients were females, aged 8 years 11 months. In each case there was marked displacement of the head of the femur on to the dorsum ilii on either side.

Nervous Cretinism.—Dr. F. G. CROOKSHANK.—The patient, a female, now aged 5½ years, was first seen in 1912, when it was noted that the skin was harsh, the gait tottery, and the knee-jerks increased. Later the gait became more ataxic and the speech became defective. As the result of treatment with thyroid extract the child could now walk and talk well, and had lost almost all her symptoms.

A Case of "Jaw-Winking."—Dr. CROOKSHANK.—The patient, a girl, aged 9 years, had congenital unilateral ptosis. When the muscles of her face were at rest the ptosis was considerable. When she depressed her jaw and "ringed" her mouth, not only did the ptosis disappear, but the sclerotic became visible on the affected side, above the cornea.

A Case of a Mesenteric Cyst which had Simulated an Intussusception.—Mr. PHILIP TURNER and Dr. H. TIPPING.—The patient, a previously healthy boy, aged 4 months, had a "crying fit," after which blood was passed *per anum*. After admission to the hospital a rectal examination showed the presence of recent blood though no lump could be felt. An anæsthetic was given, and then a movable tumour could be felt close to the umbilicus. When the abdomen was opened the lump was found to be a tense cyst, about an inch in diameter, situated in the mesentery in the angle between the ileum and the colon. It bulged into both these portions of the intestine, causing obstruction at the ileo-cæcal valve. The cyst-wall was so incorporated with the ileum and the colon that it could not be removed. The cyst was incised, the greater part of the wall clipped away and the remainder sutured to the parietal peritoneum. The child made an excellent recovery, but a sinus which discharged glairy odourless fluid still persisted. Histologically the lining membrane of the cyst had the same structure as the mucous membrane of the small intestine.

Two Cases of Dermatitis Herpetiformis Treated by Counter-Irritation.—Dr. W. J. MIDELTON.—The first patient, aged 7 years, had scarlet fever when three years old and this was followed by the dermatitis. The disease persisted until February, 1912, when counter-irritation was commenced. The patient was well in three weeks. There had since been occasional slight relapses.

In the second case, a boy, aged 7 years, the same treatment has been equally satisfactory.

Anterior Poliomyelitis, with Paralysis of the Abdominal Muscles and Collapse of the Lung.—Dr. G. A. SUTHERLAND.—The patient, a female, aged 15 months, had an indefinite illness, thought at one time

to be measles, in May, 1913. Three weeks later there was dulness over the right lung, and exploratory puncture was several times performed with a negative result. When readmitted in October, 1913, the legs showed signs of former poliomyelitis. The abdomen was prominent, and on crying two marked bulgings were seen, one occupying the upper two thirds of the right abdominal wall, and the other the lower two thirds of the left side. Over the right lower lobe posteriorly there were impaired breath-sounds. It was suggested that the pulmonary signs were due to massive collapse of the lung, and that this was due to paralysis of the muscles of the abdominal wall.

Enlargement of the Liver with Ascites.—Dr. J. W. CARR.—The patient, a boy, aged $2\frac{1}{2}$ years, was admitted to hospital for ascites in March, 1913, and was tapped on thirteen occasions. The liver now extended between two and three inches below the costal margin: it was hard and the surface felt slightly granular. There had been no hæmatemesis and only one transient attack of jaundice shortly before his first admission. Dr. Carr considered that the liver was almost certainly cirrhotic, but the cause of the cirrhosis was obscure.

Osteogenesis Imperfecta, with great Distortion of the Bones of the Lower Limbs.—Dr. F. J. POYNTON.—The patient, a girl, aged 11 years, has been admitted three times to University College Hospital and many times to Great Ormond Street with fractures of the bones of the legs. Her bones had been soft and easily broken from birth and she had never been able to walk alone.

Case for Diagnosis.—Dr. POYNTON also showed a girl, aged 5 years, with a slightly enlarged liver and spleen. Examination showed marked cyanosis of lips, tongue, and throat, and clubbed fingers. No bruits could be heard, but in May, 1913, there was a pulmonary systolic bruit: it was doubtful whether this was congenital or hæmic. Wassermann reaction negative.

Three Children in the same Family with Alopecia Areata.—Dr. POYNTON.—The cases had been treated successfully with suprarenal extract internally and salicylic and carbolic acids externally.

Ununited Fracture of the Neck of the Femur Treated by Operation eight years after the Injury.—Mr. H. A. T. FAIRBANK.—When first seen the limb was wasted and held in an everted position. Flexion was limited and abduction practically abolished. Real shortening two inches. A skiagram showed an ununited fracture and coxa vara. The fibrous bond of union was excised and two screws were driven from the trochanteric surface through into the head. The operation had been successful in abolishing the pain and arresting the progress of the deformity.

Osteo-periostitis of the Upper End of the Femur of Uncertain Origin.—Mr. FAIRBANK.—There were thickening and tenderness at the upper extremity of the femur, and the child, a girl, aged 5 years, limped slightly. The skiagrams suggested an inflammatory lesion, not a new growth. The Wassermann reaction was negative and mercury and iodides had been given without effect.

Two Sisters with Deformity of Bones and Splenomegaly.—Dr. F. LANGMEAD.—The first child, aged 6 years 5 months, showed skeletal changes

closely resembling those of rickets. The spleen extended downwards as far as the anterior superior spine of the ilium and filled the left side of the abdomen. The liver extended down an inch below the costal margin. In the second case, aged 5 years 4 months, the bony changes resembled those in the first, but had developed to a less degree. The spleen was also enlarged, but less so, reaching about an inch below the costal margin. The chief points of interest were: (1) The progressive character, both of the skeletal changes and the splenomegaly; and (2) the fact that this occurred at an age when the usual period for active rickets was over.

Dactylar Deformity from Amniotic Bands.—DR. F. G. CROOKSHANK.
— Skiagrams showed well the bony deformities and less clearly the multiple constrictions of the fingers of a boy, from whose hands at birth the mother stated the doctor had removed a number of “strings like wires.”

Philadelphia Pediatric Society.

November the 11th, 1913, THEODORE LE BOUTILLIER, M.D., President.

Congenital Malformation.—DR. ALICE WELD TALLANT reported the case of a baby born in the out-patient maternity service of the Woman's Medical College of Pennsylvania. It was the eighth child of a healthy-appearing Italian woman, aged 38 years; the other children had been normal and there was no history of syphilis.

The more conspicuous deformities were double hare-lip and cleft palate and congenital umbilical hernia. The hernia was nearly half the size of the child's head, and the sac contained coils of intestine. To the left of the hernia and attached to it was a dark red, tongue-shaped mass, suggesting spleen in appearance. The cord, which, about two inches from the child's body, had dwindled to two vessels without any Whartonian jelly, was attached between the hernia and this mass; its entire length was 25 in. The vessels ruptured close to the sac, but no bleeding followed. Other malformations were a cleft sternum, a supernumerary digit attached to the left little finger, hypospadias and undescended testicles.

The baby was operated on by Dr. H. C. Deaver before it was fifteen hours old. After the incision of the sac and the breaking-up of adhesions which had formed between it and the intestines, the hernia and accompanying mass were replaced in the abdominal cavity, which was closed in the usual way. The child recovered from the immediate effects of the operation, but died thirty hours later. It had passed three meconium stools and showed no signs of obstruction, but had a very variable temperature—from 96.4° F. to 103.8° F.

Autopsy showed as other abnormalities the absence of the great omentum and the shortening of the lesser omentum, pulling the stomach up and allowing the formation of adhesions between it and the retroperitoneum. The left adrenal was four times the natural size and the left kidney larger than the right. The right common iliac artery was small, and the right hypogastric absent. The mass, which had protruded beside the hernia,

was found to be a vascular tuft composed largely of convoluted blood-vessels.

Such hernias occur about once in 5000 cases. There may be actual defect in the abdominal wall, and the sac may contain the liver, stomach, spleen, pancreas, kidney, or even the heart, in addition to the intestines. The ætiology may be mechanical, or disease may be a factor. More often there is arrest of development in the second month or earlier, before the closure of the abdominal wall. Except when the sac is small, the outcome of an operation is likely to be unsatisfactory; while without operation the child usually dies of rupture of the sac, strangulation of the hernia, or peritonitis.

Unilateral Hypertrophy of the Leg.—Dr. JOHN SPEESE reported two cases of congenital unilateral hypertrophy. The first case occurred in a boy, aged 5 years, in whom hypertrophy of the frontal and temporal bones was noted soon after birth. The growth increased progressively until a distinct protrusion is now present, and the circumference of the skull on the affected side is 2 cm. greater than the opposite half. The hypertrophy is entirely confined to the bone, the soft parts being uninvolved. This case is of particular interest, because instances of this type are usually found in patients who are mentally deficient and have other congenital defects, whereas this boy is entirely normal in every other respect. The second case was a girl, aged 10 years. Her parents state that an enlargement of the great toe of the right foot was noted two months after birth, continuing uninterruptedly since. Examination discloses an overgrowth of the soft tissues about the knee, calf, and great toe. The right leg is one inch longer than the left, and the knee and calf are two inches greater in circumference. From toe to heel the right side is one inch larger than on the left side, due to overgrowth of the toe, which is several times greater than the left toe. Amputation of the toe was performed, and sections of the soft tissues show overgrowth of the fatty tissue and rarefaction of the bone structure. The hyperplasia about knee and calf is also presumably due to overgrowth of the fatty tissue. The ætiology is not clear, as this patient is also normal in every other particular, and has shown no recurrence of the hypertrophy since operation, as has been reported in several instances.

Bacteriological Diagnosis of Alimentary Disease.—Dr. RALPH VINCENT, of London, by invitation, gave a lantern demonstration of photomicrographs illustrating the bacteriological diagnosis of alimentary disease in the infant and child. The study of the growth and action of organisms in milk in normal and abnormal conditions was essential to the comprehension of the biochemical processes occurring in the intestine. The organisms were classified according to their growth and action upon milk: (1) organisms producing lactic acid but not producing gas—*Streptococcus lacticus* and *Bacillus lacticus*; (2) organisms producing lactic acid, carbon dioxide and alcohol—colon group, *Bacillus acidi lactici*, *Bacillus lactis aerogenes*, *Bacillus coli communis*, etc.; (3) organisms growing in pasteurised milk but not in raw milk—*Bacillus putrifidus* and *Bacillus aerogenes capsulatus* (Welch); and (4) organisms growing in milk that has been boiled (212° F.) but not in raw milk—*Bacillus subtilis*, *Bacillus mesentericus*, etc. The governing condition in the intestine of the healthy infant was the growth and action of the *Streptococcus lacticus*. This organism was extraordinarily powerful in inhibiting and controlling the growth of all other

organisms. This was well seen when pure raw milk was incubated at 38° C. for from eight to twenty-four hours. As a rule this organism was found in practically pure culture. If the milk was pasteurised before incubation a wholly different microscopical picture was seen. The effect of an abnormal or unnatural diet was seen in the change in the intestinal flora. As the *Streptococcus lacticus* failed to act owing to the abnormality of the media, so the other organisms came into action, with the result that unhealthy or pathological conditions arose in the alimentary canal. Dr. Vincent then discussed the bacteriological diagnosis by means of direct microscopical examination of the intestinal dejecta and of cultures in milk made from the dejecta. The number and prominence, or otherwise, of the colon organisms constituted a valuable diagnostic criterion, and Dr. Vincent had designed a method of differential staining by which the colon organisms were stained light blue and the lactic organisms a deep purple.

Fat in Moist Fæces.—Dr. GORDON J. SAXON, by invitation, demonstrated a new method for the differentiation of fat, fatty acid and neutral fats in moist fæces.

Abstracts from Current Literature.

Medicine.

A case of ankylostoma anæmia (*Osp. d. Bamb. di Milan.*, 1913, i, p. 169).—G. B. Grassi records a fatal case in a boy, aged 4½ years. His symptoms were loss of flesh and increasing pallor of the skin for two months, continual fever and night-sweats. Blood examination on admission to hospital showed hæmoglobin, 18 per cent.; red cells, 1,600,000; white cells, 14,000. Differential count: polymorphs, 40 per cent.; lymphocytes, 32 per cent.; large mononuclears, 1 per cent.; eosinophiles, 25 per cent.; transitionals, 2 per cent. No nucleated red cells nor myelocytes. Death occurred eight days after admission. The necropsy showed ankylostomata in the intestine, especially in the duodenum, and numerous hæmorrhagic points in the mucosa. Histologically there was a chronic inflammation of the intestinal wall, in which the mucosa, submucosa, and to a less extent the muscular coat were involved. The Malpighian corpuscles of the spleen showed an over-production of leucocytes, which were mainly mononuclears of medium size. The spleen-pulp contained an unusual amount of blood, which did not contain any eosinophiles but a large number of polymorphs, many of which were loaded with pigment.

J. D. ROLLESTON.

Barlow's disease in a breast-fed child (*Rev. de med. y. Hig. práct.*, 1913, i, p. 688).—C. Morelli records a case in a male infant, aged 7 months. Three months previously the mother had had facial erysipelas, and since then the child had suffered from intestinal disturbance. He had recently vomited and been feverish. On examination the upper extremities of the left femur and right tibia were very tender, and showed a fusiform swelling. Pin-point hæmorrhages were present in the gums, and ecchymoses of various sizes were scattered over the body. Breast-feeding was continued, and lemon-juice was given between the feeds twice a day. Injections of peptone

as recommended by Nobécourt were also given, and complete recovery took place in $1\frac{1}{2}$ months.

J. D. ROLLESTON.

Banti's disease in childhood (*Arch. f. Kinderheilk.*, 1913, *Baginsky Festschrift*, p. 254).—A. D'Espine describes two personal cases and the others in the literature of this disease, and concludes that (1) perhaps some of the cases not noticed until adult age have really started in infancy. (2) A certain number of cases of splenomegaly associated with rachitis, and considered by some as due to syphilis, are "*formes frustes*" of Banti's disease. (3) Spontaneous cure is possible. (4) Infection is not the cause of the disease, as inoculation of a monkey with splenic tissue proved negative.

F. R. B. ATKINSON.

The thermic curve in infantile Leishmaniosis (*La Pediatria*, 1913, xxi, p. 481).—G. Ceronia records twelve cases with temperature charts to show that the fever is an anaphylactic phenomenon. There is a continual and gradual production of anaphylotoxin by the elaboration of albuminoid bodies derived from the destruction of the parasites localised in various organs. In other words, by the joining of antibodies with antigen in the presence of complement, disintegration of the antigen occurs and develops a pyogenic substance.

VINCENT DICKINSON.

Infantile kala-azar (*La Med. de los Niños*, 1913, xiii, p. 189).—Pittaluga gives a report on a disease endemic among the children of Tortosa and the neighbouring villages on the Spanish Mediterranean coast. Malaria is rife there, but is differentiated from the disease which the local practitioners have regarded as cases of "splenic leukæmia," pseudo-leukæmia or Hodgkin's disease. In many of the children noma of the mouth is an intercurrent or terminal complication. The course is subacute and of variable duration, from a few weeks to a few months, and nearly all the children die within a year of their first signs of illness. In the last six years among a population of 2000 inhabitants there have been in children aged from six months to six years 47 deaths registered as splenic leukæmia, etc. In a typical case where death occurred after noma of the mouth, Pittaluga found a great number of Leishman's parasites in the spleen-pulp—some of the parasites were intra-cellular, some in small groups, and some in the intercellular plasma. He has not hitherto found the flagellated forms in any of his preparations, but in cultures he has obtained flagellated forms exactly like *Leptomonas* and *Crithidia*, which on inoculation, especially in dogs, gave rise to Leishmaniosis. There can be no doubt, he concludes, that infantile kala-azar, due to Leishman's parasite, is endemic on the Spanish Mediterranean littoral. He inclines to the view that fleas may be the agent conveying the parasite from the Leishmaniosis in dogs to man.

M. D. EDER.

The pulse and arterial tension of the child (*Gaz. des Hôp.*, 1913, lxxxvi, p. 837).—P. Balard.—Koessler, in 1912, applied the oscillometric sphygmomanometer to the study of maximal and minimal pressures in infants, and showed that in the normal child both maximum and minimum arterial pressure increased progressively up to adult life. The author finds the pulse-rate diminishes for the first three days after birth and then continues unaltered for the first year. About the third year it rapidly slows and continues to do so up to adult life. It is more rapid in girls than boys up to the age of eleven years. At birth the maximum and minimum blood-

pressures are about 40 and 25 mm. respectively; they increase till by the tenth day they are about 75 and 45 mm.; thenceforward they gradually increase till adult life.

J. PORTER PARKINSON.

Murmurs of no significance in the præcordial region of children and young persons (*Arch. f. Kinderheilk.*, 1913, *Baginsky Festschrift*, p. 377).—**C. Hochsinger**.—Murmurs of this kind are more frequent in children and young persons than in older individuals: they first occur with any frequency after the third year, and most frequently of all between the tenth and fourteenth years. They can be divided into those which are cardio-pulmonary, and those which arise within the heart, the so-called accidental or functional cardiac murmurs. The former disappear on expiratory holding of the breath; the latter are not affected by respiration. The latter form of murmur does not occur in infants or very young children, and the former very rarely. The murmur called by Schlieps atonic cardiac murmur is not the same as that called accidental or functional, but refers to that form of murmur that occurs in conditions of juvenile cardiac atony (lowered blood-pressure, bad filling of the arteries, dilatation from weakness). This murmur is of importance, but is very rare.

F. R. B. ATKINSON.

Congenital familial dextrocardia (*Journ. Amer. Med. Assoc.*, 1913, LX, p. 1064).—**S. Neuhoof** reports the occurrence of dextrocardia with transposition of the liver and spleen in a brother and sister. Only one other instance of this anomaly occurring in members of the same family seems to have been recorded. In the present instance the girl died of tuberculosis (? at what age). The brother is alive and aged 26. The cardiac area is normal to percussion, but electro-cardiograms show interesting features. In lead I (from right arm to left arm) the position of the summits P, R, T are exactly the inverse of the normal. Such a condition is found only in congenital cardiac transposition, and may, therefore, be used to differentiate it from displacements due to pleuritic effusions, adhesions, tumours, etc. Leads 2 (from right arm to left leg) and 3 (from left arm to left leg) also show changes typical of dextrocardia, all the summits being higher in the third lead than in the second.

T. R. WHIPHAM.

Persistent ductus Botalli and its diagnosis by the orthodiagraph (*Amer. Journ. Med. Sci.*, 1913, CXLV, p. 543).—**H. Wessler** and **M. H. Bass** give a review of the literature on the diagnosis of patent ductus and a careful study of five cases. There are good reproductions of their orthodiagraphic figures and diagrams. They conclude, in agreement with other observers, that in a case of pure patent ductus one need not expect enlargement of the heart. They discuss the differential diagnosis of this class of congenital heart disease, and lay emphasis on the help that may be obtained by observing the heart in action by skiagraphy, noting that the marked pulsation in the shadow corresponding to Gerhardt's sign is a most suggestive feature.

REGINALD MILLER.

Early obliteration of the ductus arteriosus (*Journ. de md. de Bordeaux*, 1913, LXXXIV, p. 216).—**Lefour** and **Balard** report a curious case from a syphilitic infant which died at the age of 8 days of jaundice and purpura. The ductus is usually not completely obliterated until the thirtieth day, which obliteration is produced by stretching or twisting, assisted by a

proliferation of the tunica intima. In their specimen, which is well shown in a picture, the ductus was found to be dilated except at its extremities, where it was narrowed. Its dilated portion was full of clot, which was limited to this part, and appeared to be the cause of the obliteration of the canal at this early date.

REGINALD MILLER.

A case of cardiac malformation with multiple anomalies of the circulatory system (*Arch. des mal. du cœur*, 1913, VI, p. 720).—**L. Rivet** and **L. Girard** record the case of a female infant whose mother was tuberculous and father was alcoholic. Their two other children were healthy. Cyanosis was present at birth, and persisted till death, twenty-five days later. The necropsy showed a single ventricle, an incompletely divided auricle with inversion of the venous trunks, obliteration of the pulmonary artery at its orifice, persistence of the ductus arteriosus, and a common trunk for the pulmonary veins ending in the liver instead of in the auricle, and anastomosing with the portal veins and inferior vena cava.

J. D. ROLLESTON.

Localisation of Spirochæta pallida in the heart-muscle in congenital syphilis (*Journ. Amer. Med. Assoc.*, 1912, LVIII, p. 689).—**A. Warthin** and **E. J. Snyder** report two interesting cases of congenital syphilis in which spirochætes were found in the heart-muscle only. In both cases translucent nodules were present in the heart-muscle, showing pale degeneration of muscle-fibre, epithelioid proliferation of the stroma, cell-infiltration and fatty degeneration in sections stained by Levaditi's method, numerous spirochætes were found in these nodules, but no spirochætes nor histological lesions of syphilis in any other organ. The skin presented cutaneous syphilides, but was not examined for spirochætes. One infant was two months old, the other eight days. The authors remark that the absence of spirochætes in the liver, lungs and spleen is unusual. They suggest that the heart-muscle is a place of predilection for the multiplication of spirochætes.

C. F. MARSHALL.

Course, prognosis and treatment of endocarditis in children (*Amer. Journ. Obst.*, 1912, LXVI, p. 478).—**W. C. Calhoun** reviews the subject of chronic endocarditis in children. He points out its intimate connection with rheumatism, and lays stress upon the mode of life that these patients should adopt with a view to preventing further rheumatic attacks and strengthening the heart as much as possible. He holds that in chronic cases the nitrogenous and carbohydrate constituents of the diet should be cut down, red meats not being allowed more than three times a week. He is, however, less strict on the subject of limitation of exercise, merely warning against too strenuous play.

REGINALD MILLER.

Acute endocarditis in children (*Journ. de M'd. de Paris*, 1913, XXXIII, p. 258).—**P. Nobécourt**.—Acute endocarditis is common in children, but rare under three years old. It is always infective in origin, generally simple, but occasionally malignant in nature. Sometimes it appears to be idiopathic, but often adenoids or enlarged tonsils show signs of the entrance of infection, or rheumatism is present in one of its numerous "*formes frustes*." Rheumatism is the commonest cause; the curve of acute endocarditis follows that of rheumatism, and with it is to be placed chorea. Scarlet fever accounts for 4-5 per cent. of cases; measles, smallpox, diphtheria, typhoid, erysipelas,

mumps, gonorrhoea, pneumonia, osteomyelitis, stomatitis also cause some cases. Tuberculous acute endocarditis is rare. Heredity seems to predispose. Endocarditis may be the direct result of an illness or be due to a secondary infection. The microbes are very numerous, and the results vary with them and also with their virulence. The symptoms of acute endocarditis are few. The temperature is often not affected or it may be slightly irregular; there is rarely palpitation, pain, dyspnoea or rapidity of the pulse. Inspection and palpation teach us nothing. Percussion shows an increase of the deep dulness. On auscultation there is dulling of the first sound, like that which is produced by shutting a door cased in indiarubber. If the aortic valve be affected the second aortic sound may also have this character. This may last a fortnight and then a murmur develops, or the sound may become normal again. The murmur is at first soft and low, not well propagated to the axilla and not heard at the back. Sometimes it is heard along the right edge of the sternum. The murmur may grow gradually louder, or it may disappear and reappear in some weeks or months. One must not, then, hasten to declare an acute endocarditis cured. A fresh rheumatic attack may re-start the process over again. In acute malignant endocarditis general symptoms such as shivering, dyspnoea, vomiting, fever, outweigh the local signs. The general condition is grave, and may resemble typhoid fever, meningitis, etc. Subacute cases are more insidious, with wasting, pallor, and occasional fever. A variable murmur is present as a rule.

J. PORTER PARKINSON.

Acute endo-myocarditis in an infant (*Le nourrisson*, 1913, i, p. 291).—**A. B. Marfan and F. Saint-Girons**.—A male infant, aged 18 months, was admitted to hospital for broncho-pneumonia and died a fortnight later. No cardiac signs were found during life. Post mortem, an adherent clot was seen on the tricuspid valve, which showed recent inflammatory nodules, and similar nodules were present on the mitral valve. The myocardium was pale. There were numerous pulmonary emboli. Allusion is made to a similar case reported by Hawkins in the *BRITISH JOURNAL OF CHILDREN'S DISEASES*, 1910, vii, p. 399.

J. D. ROLLESTON.

A case of septic-pyæmia (*Med. Record*, 1913, lxxxiii, p. 711).—**T. G. Orr** reports a case of malignant endocarditis in a child aged only 2 years and 10 months, the primary source of infection being a septic finger. Clinically, the illness was associated with an erythematous rash, enlargement of the spleen and infarction. The diagnosis was verified by an autopsy, but the organism, though visible in sections of the tissues, was not isolated. There was no history of any previous illnesses or heart disease in this case.

REGINALD MILLER.

Chronic infective endocarditis (*Arch. of Ped.*, 1913, xxx, p. 328).—**E. Cautley** remarks upon the comparative rarity of infective endocarditis during childhood, in spite of the frequent occurrence of simple valvulitis at this age. Two cases of chronic infective endocarditis are quoted in children of 8 and 18 years of age. In both there was a fatal termination after about eight months of illness, and in neither was the infecting organism determined with certainty. Four other cases of a less chronic type are also mentioned.

REGINALD MILLER.

Asystole in children (*Journ. de Méd. de Paris*, 1913, xxxiii, p. 795).—**P. Nobécourt**.—This is due to insufficiency of the myocardium or to

causes increasing the peripheral resistance. The symptoms differ from those in the adult. Cerebral troubles are rare and cyanosis not so marked, the skin being rather pale and anæmic-looking. Œdema is slight or wanting. Ascites and enlargement of the liver are common. The urine is scanty, high-coloured, and rich in urates. There is dyspnœa but rarely orthopnœa, but there is rarely œdema of the lungs or bronchitis; more commonly there is slight dulness and weak breathing at one base due to collapse from embarrassment of the diaphragm owing to the enlarged liver. There is often impairment and harsh breathing at the angle of the left scapula due to compression by the enlarged heart. Congestion of the lung may lead to generalised bronchitis, often specially persistent at the apices, and may raise a suspicion of tuberculosis. Dry or sero-fibrinous pleurisy often develops, sometimes owing to a subpleural infarct. The pulse is frequent, unequal and irregular. The arterial pressure is lowered. The heart is transversely enlarged, the sounds are feeble and murmurs may be present, due to dilatation or valvular disease. The jugular veins are distended. The evolution of these symptoms may be rapid or slow, and they may be progressive or show intervals of improvement. The author attaches great importance in suspected cases of early asystole to daily weighing, a sudden increase of weight due to a latent œdema being one of the earliest signs of asystole; increase in the size of the liver is another early sign. It is in the early stages that treatment is most efficacious.

J. PORTER PARKINSON.

Myocardial syndromes in the course of acute infections in children (*Journ. de M'ed. de Paris*, 1913, xxxiii, p. 459).—P. Nobécourt distinguishes two varieties—(1) latent, (2) cardiac. In the first variety there are no subjective phenomena, but on examination there is variation in the size and rhythm of the heart and in the blood-pressure, and slight enlargement of the liver. This myocardial change may or may not be associated with endo- or pericarditis. The heart-sounds become weakened, especially at the base, or the second pulmonary sound may be accentuated. There is sometimes a cantering action; finally a systolic apical murmur may appear, due to a shortening of the chordæ tendinæ. The cardiac dilatation may be temporary or persistent and is very apt to recur. With it there may be rapid or slow action, the latter being chiefly seen in convalescence from typhoid fever, pneumonia, diphtheria, etc., and it may be accompanied by various kinds of arrhythmia and low tension. In the cardiac forms there are fever, dyspnœa, general œdema, congestion of the base of the lungs, and sometimes subcutaneous nodules. Præcordial pain may be present, and the heart is dilated and the liver-dulness increased. The heart-sounds are feeble but the second pulmonary accentuated. The pulse is rapid and irregular. This condition may last three or four months, or there may be rapid and sudden death in a few days. In the infectious fevers, excluding acute rheumatism, the myocardium is as a rule affected alone, but in rheumatism there is often peri- and endocarditis as well. In infectious fevers the patient becomes pale and cyanotic, with cold extremities, dyspnœa, feelings of suffocation and scanty urine. The heart's action is rapid as a rule, the pulse often irregular and of low pressure. The liver is enlarged and the bases of lungs congested. There is acute parenchymatous myocarditis, but not often interstitial changes except in protracted cases.

J. PORTER PARKINSON.

An instance of premature beats arising in the auriculo-ventricular bundle of a young child (*Amer. Journ. Med. Sci.*, 1913, cxlv, p. 667).—

T. Lewis and **H. W. Allen** describe this condition in a child aged $4\frac{1}{2}$ years, and give polygraphic and electro-cardiographic curves of the condition.

F. R. B. ATKINSON.

Acute pericarditis in children (*Journ. de Méd. de Paris*, 1913, xxxiii, p. 383).—**P. Nobécourt**.—The frequency of pericarditis varies much with age. It is not uncommon in the newborn and under the first year; it diminishes till five or six years of age, and then increases in frequency up to the age of ten to fifteen years. The effusion in young children is generally purulent, but becomes serous in older ones. In infants it is often pyogenic from puerperal infection of the umbilical cord. Up to five years it is generally pneumococcal or pyogenic, secondary to bone disease, abscess, impetigo, sore throat, stomatitis or enteritis. It may also be due to acute specific fevers. Over seven years rheumatism is the most frequent cause, and less often chorea. Occasionally pericarditis may be tuberculous. The author discusses the diagnosis of the purulent varieties, which are so often latent and escape recognition.

J. PORTER PARKINSON.

Chronic pericarditis and pericardial adhesions in childhood (*Journ. de Méd. de Paris*, 1913, xxxiii, p. 719).—**P. Nobécourt**.—Chronic pericarditis is usually due to rheumatism or tuberculosis, but occasionally to syphilis. The rheumatic form is apt to be progressive owing to fresh attacks of the poison, and is always accompanied by endocarditis and by considerable enlargement of the heart due to myocarditis. The symptoms are dyspnoea, cardiac oppression, palpitation, oedema, enlargement of liver, oliguria, etc. A distinctive feature of the cardiogram is want of the pre-systolic wave due to auricular contraction. Tuberculous pericarditis may produce adhesion of the pericardium; the adjacent mediastinum is always implicated. The heart is rarely large and may be atrophied. The liver is always enlarged and there is often tuberculous peritonitis. Never forget to examine the pericardium in a child with ascites and a large liver.

J. PORTER PARKINSON.

Prognosis in cardiac disease in childhood (*Amer. Jour. Dis. Child.*, 1913, v, p. 104).—**C. Hunter Dunn** gives the immediate mortality of rheumatic cardiac disease as 20 per cent., and the mortality within ten years as 50 per cent. The mortality is chiefly seen during childhood; after young adult life is reached it is only 7 per cent. The chief cause of death in childhood is fresh rheumatic carditis leading to heart failure. The particular valvular defect is of small moment with the exception of aortic disease, which appears to be a particularly fatal lesion in childhood. Such patients as survive childhood show a remarkable freedom from cardiac disability; the majority can live normal active lives. Valvular disease acquired in adult life leads to more marked disability.

REGINALD MILLER.

Rheumatism in childhood (*Practitioner*, 1913, xc, p. 389).—**F. J. Poynton**.—*Ætiology*: The virus, a diplococcus, can be transferred from mother to fetus. Heredity is an important factor. The disease is not very rare under five years of age, but is exceptional during infancy. The avenue of infection is through the tonsils. Damp, poverty, insanitary homes favour the disease. *Pathology*: There are numerous focal lesions caused by the germ, and in these foci the micrococci are rapidly destroyed. The lesions, according to Coombs, Aschoff and others, contain characteristic cells.

The poison causes marked dilatation of the small blood-vessels and perivascular changes. The connective tissues show a peculiar gelatinous swelling. Suppuration does not occur. *Symptomatology*: In childhood, as compared with adults, the manifestations are most varied and numerous, the articular lesions are less severe, the heart affections most frequent, as also nervous symptoms and subcutaneous nodules, anæmia most marked, sweating less frequent, hyperpyrexia very rare. Chorea is often associated with the early stages of mitral stenosis. *Treatment*: Salicylate of soda is not such a valuable drug as generally believed. Vaccines and serum have given excellent results in some cases, but in others they have failed.

F. R. B. ATKINSON.

Defective development from arthritis in early life (*Amer. Journ. Med. Sci.*, 1912, cXLIV, p. 469).—**G. Dock** details a good example of the state of growth reached at the age of twenty-four years in the case of a boy who had suffered from chronic arthritis without heart lesion since the age of eleven years. The case appeared to conform to the type known as rheumatoid arthritis. Good photographic reproductions are given showing the patient and a radiogram of one hand. Measurements, compared to normal, are also included.

REGINALD MILLER.

Chronic tubercular articular rheumatism, simulating Still's disease (*La Pediatria*, 1913, xxi, p. 401).—**O. Cozzolino** publishes details of this case of a girl, aged 7 years. He discusses the question whether Still's disease can be considered a pathological entity and comes to a negative conclusion. Improvement followed the application of Bayer's salen-alcohol, the pains disappearing in a few days, the swelling, however, remaining unaltered. Iodarsol was also administered and heliotherapy employed. The child gained $1\frac{1}{2}$ kgrm. in two months, and the appetite returned. The articular swelling persisted together with the spinal and nuchal rigidity, and the temperature remained above normal.

VINCENT DICKINSON.

Rheumatic nodules in a case of chorea (*Arch. de méd. des Enf.*, 1913, xvi, p. 522).—**J. C. Navarro** records a case of paralytic chorea, with multiple nodules and aortic regurgitation. It is interesting to note that he states that this is the first example of rheumatic nodules which he has seen. He quotes Frorips as the first to describe them (1843).

REGINALD MILLER.

Treatment.

Treatment of scarlet fever with intravenous injections of neo-salvarsan (*Arch. of Pediat.*, 1913, xxx, p. 352).—**L. Fischer** treated five cases of septic scarlet fever, aged from $1\frac{1}{2}$ to 9 years, with intravenous injections of neo-salvarsan. The dose was 0.2 grm. dissolved in 40 c.c. of sterile water. Wassermann's reaction was negative in 3, probably positive in 1, and in 1 no report was made. No reaction such as acute febrile attack, shock, or rash followed the injections. Three died, 1 recovered, and 1 was still in hospital (*cf. BRITISH JOURNAL OF CHILDREN'S DISEASES*, 1912, x, pp. 187-188.)

J. D. ROLLESTON.

Salvarsan in scarlet fever (*Verhandl. d. Deutsch. Kongr. f. inn. Med.*, 1913, xxx, p. 137).—**Jochmann** treated 117 cases of scarlet fever in the

Rudolf Virchow Hospital partly with intravenous and partly with intramuscular injections. The dose was 0.1 grm. to 10 kilos of body-weight, and no more than two injections were given in children: 109 received salvarsan, and 8 neo-salvarsan. Fifty-eight of the salvarsan cases showed no after-effects, while 51 one to two hours after injection had a rise of temperature of 1° or 2° C., vomited once or twice and had diarrhoea. The symptoms subsided in four to six hours. Jochmann, as the result of his experience, recommends salvarsan in severe toxic scarlet fever and in necrotic angina. It is unnecessary in the mild cases, especially as it does not prevent complications. He deprecates the use of neo-salvarsan, as five of the eight cases treated with it showed signs of severe intoxication. In the subsequent discussion **Schreiber** spoke highly of the local use of salvarsan in the necrotic angina of scarlet fever (*cf.* BRITISH JOURNAL OF CHILDREN'S DISEASES, 1913, x, pp. 187 and 543).

J. D. ROLLESTON.

New aspects of the serum treatment of diphtheria (*Prag. med. Woch.*, 1913, xxxviii, p. 565).—**A. Ganghofner** recommends intramuscular in preference to subcutaneous injections. Intramuscular injection offers the advantage of a much more rapid absorption of the serum, is just as readily carried out, and is less painful than the subcutaneous method. In mild cases Ganghofner gives 1500 units, severer cases, including those in which the larynx is slightly affected, receive 3000 units, and in the severest faucial and laryngeal cases he gives 6000 to 12,000 units. When an individual who has already been treated with horse-serum for diphtheria develops a second attack it is advisable in order to avoid anaphylaxis to use the serum of some other animal, but if one is compelled to use horse-serum, a few drops should first be given subcutaneously, and a few hours later the full dose should be given intramuscularly.

J. D. ROLLESTON.

Schiötz method of ridding diphtheria cases and carriers of diphtheria bacilli (*Journ. Amer. Med. Assoc.*, 1913, lxi, p. 26).—**F. L. Wright** finds that spraying the nose and throat with a twenty-four-hour culture in plain bouillon of the *Staphylococcus pyogenes aureus* is very efficacious in ridding the throat of diphtheria bacilli. The method was used in the New York State Agricultural and Industrial School, with the result that in diphtheria cases the average time of isolation was reduced from 32 days with the old methods to 22 days, and in the case of carriers from 34 to 11 days. The writer is of opinion that the method is absolutely innocuous.

T. R. WHIPHAM.

The treatment of diphtheria carriers (*Journ. Amer. Med. Assoc.*, 1913, lxi, p. 1027).—**H. Albert** details the various methods which have been advocated for ridding diphtheria carriers of bacilli. He considers that the organisms are harboured chiefly in the crypts of the tonsils, and has obtained the best results by treating the crypts with a solution of silver nitrate (5 to 10 per cent.), applied by means of a thin flexible applicator, combined with a mild alkaline and antiseptic spray for the nasal cavity, and 1 per cent. solution of hydrogen peroxide as a mouth-wash and gargle.

T. R. WHIPHAM.

The staphylococcus spray treatment of diphtheria carriers (*Journ. Amer. Med. Assoc.*, 1913, lx, p. 1876).—**A. M. Alden** advocates the use of the staphylococcus spray to the throats of diphtheria carriers. The culture

used is a composite one made by mixing equal portions of three different strains of *Staphylococcus pyogenes aureus*, isolated from throat cultures. These are grown on agar and afterwards transferred to broth. The material sent out is 30 c.c. of an eighteen-hour broth culture grown at 37·5° C., and is enclosed in a cylindrical bottle covered with a rubber cap and sealed with paraffin. Some of the culture is poured into a sterilised atomiser and the throat and nasal passages are then well sprayed. This is repeated at least once a day until two consecutive cultures made at intervals of twenty-four hours are negative. The author tried the treatment on sixteen cases in which diphtheria bacilli were present for at least four weeks, and in fifteen the throat was free from specific organisms in periods varying from two to eight days. The number of sprayings necessary varied from two to twelve. In one case the treatment failed and the patient was released by a negative virulence test. Possibly the failure was due to the culture having become inactive or to defective application. The only complications of the treatment observed were slight oedema of the face, increased nasal catarrh, sore throat and headache.

T. R. WHIPHAM.

Tonsillitis following use of staphylococcus spray (*Journ. Amer. Med. Assoc.*, 1913, LXI, p. 393).—**Clara M. Davis** reports the case of a school-girl, aged 18 years, who a fortnight after an operation for deflected nasal septum was found to be suffering from diphtheria. Bacilli being still present sixteen days later she was given a pure culture of *Staphylococcus aureus* emulsified with sterile normal salt solution and directed to spray the nose and throat three times a day. On the following day she had a slight chill and sore throat. The temperature rose and there was a profuse nasal discharge. The throat and nose were free from membrane, but the tonsils were much swollen and covered with discrete yellow spots and the cervical glands became much enlarged. One-grain "broken doses" of calomel and 5-gr. doses of aspirin every three hours were ordered. The temperature and pulse-rate steadily dropped and recovery was uneventful, but slow. The cervical glands were enlarged and tender for about ten days. The nasal discharge continued profuse during this time, and about five days after the beginning of the attack there was some swelling of the uvula. The patient felt much sicker (*sic*) during the attack of tonsillitis than during the initial attack of diphtheria. Cultures from the throat and nose showed abundant staphylococcus growth with a few diphtheria bacilli. The latter subsequently disappeared, but pneumococci and streptococci were present.

T. R. WHIPHAM.

Lactic acid bacillus spray for diphtheria (*Journ. Amer. Med. Assoc.*, 1913, LXI, p. 392).—**H. B. Wood** proposes the use of a lactic acid bacillus spray for diphtheritic throats. The organism is not foreign to man and is not pathogenic. A one- or two-day culture on agar is washed off in sterile normal salt solution and used in a sterile atomizer. Live organisms are required, hence no antiseptic must be used in the spray or on the mucous membrane. The author has employed the solution with success in a few cases which after the administration of antitoxin and the daily local application of silver nitrate, phenols and iodine still showed the presence of bacilli, and suggests that it may prove useful not only in the case of diphtheria carriers and during convalescence, but also in the treatment of the disease. Practitioners in the country, if without antitoxin or antiseptics, may perhaps find some advantage in swabbing or douching the nose and throat with ordinary sour milk.

T. R. WHIPHAM.

Whooping-cough (*Wien. klin. Rundschau*, 1913, xxvii, p. 230).—**Singer** regards the virus as unknown, and the vaccines prepared by Manicatide or Bordet and Gengou are valueless. He relies upon general hygienic measures, daily warm baths, good ventilation and warmth in the room together with "Pilka," the trade name for a dialysis of herbæ thymi and pinguiculæ. The dialysis is prepared from fresh extracts, and Singer believes that his good results may be attributed to the special mode of preparation.

M. D. EDER.

Treatment of severe intestinal hæmorrhage in typhoid fever by intravenous injection of human blood (*Paris méd.*, 1912 13, II, p. 150).

—**Olivier**.—A boy, aged 15 years, suffering from typhoid fever, had repeated intestinal hæmorrhage which was not checked by gelatin, antidiphtheritic serum, or calcium chloride: 30 c.c. of blood were taken from the mother's median basilic vein in a warmed and paraffined syringe and injected at once into the child's media cephalic. The hæmorrhage ceased, and the same evening the stool contained clotted blood. Recovery took place.

J. D. ROLLESTON.

Results with salvarsan in hereditary syphilis (*Am. Journ. Dis. Child.*, 1913, vi, p. 174).—**L. E. Holt** and **A. Brown**.—From November, 1911, to January, 1913, thirty-four cases of hereditary syphilis were treated in the Babies' Hospital with intravenous injections of salvarsan alone.

The injections were all made under anæsthesia at the bend of the elbow. More recently the authors have found the scalp veins such as the posterior auricular or one of the branches of the temporal more suitable. The ages of the children ranged from one month to four and a half years. The doses for children up to eight months was .05 grm. salvarsan or .075 grm. neo-salvarsan, and after that age .10 to .20 grm. salvarsan or .15 and .30 grm. of neo-salvarsan. The doses were repeated tentatively, the second dose being given two weeks after the first, and subsequent doses at intervals of from one to two months according to the result of the Wassermann test. All gave a positive Wassermann reaction except one child who had been regularly treated with mercurial inunctions for three months. In sixteen patients in whom frequent Wassermann reactions were made the average date of the disappearance of the reaction was three and a half months. The latest report on the cases was that six were positive and ten were negative, the latter having been under observation for an average of ten months. The effect of salvarsan was most marked on the skin lesions. Seventeen died, eleven from intercurrent disease, seven being from broncho-pneumonia and four from gastro-enteritis; one died from acute peritonitis. Syphilis itself caused five deaths, and multiple neuritis, probably due to the arsenic, one death. No complete necropsy was held in the last case, but examination of the median and musculo-spiral nerves was negative.

J. D. ROLLESTON.

Treatment with salvarsan in late congenital syphilis (*Am. Journ. Dis. Child.*, 1913, vi, p. 187).—**G. S. Strathy** and **G. A. Campbell** treated eighteen cases, only three of whom were under 5 years of age, the rest being

aged from 6 to 24 years. With the exception of a mentally deficient child, who was injected intramuscularly, the intravenous method was used. The dose varied with the weight, 150 lb. being taken as the average male adult weight, and 0.6 grm. salvarsan and 0.9 grm. neo-salvarsan as average doses for that weight. Salvarsan was dissolved in 300 c.c. of distilled water, and

neo-salvarsan in 150 c.c. 1 c.c. of the latter and 2 c.c. of the former were given for each pound of weight of the patient. All improved clinically. Gummata, periostitis and ulcers disappeared rapidly. Keratitis, which was present in eight cases, healed more rapidly than under mixed treatment. The results were better than those obtained by mercury, which had already been used with little benefit in about half the cases. In spite of repeated doses, only five gave a negative Wassermann reaction after treatment. The younger the child, the more quickly did the reaction become negative. Nearly all the cases were treated in the out-patient department, and no bad effects resulted.

J. D. ROLLESTON.

Treatment of pyodermia by Ziehl's fluid (*'La Pediatria,'* 1913, xxi, p. 525).—**E. Palmagiani** uses the following: Fuchsin 1, absolute alcohol 10, pure phenol 5, distilled water 100. The infected skin was painted over daily. The results were good, the impetigo ceased spreading, the crusts dried up, and after six to ten days dropped off, leaving healthy skin.

VINCENT DICKINSON.

Splenic leukæmia and radiotherapy (*'Bull. Soc. Sci. méd. de Bucarest,'* 1911-12, p. 98).—**A. Craciuneano** records a case in a boy, aged 14 years, who had been suffering for two years from febrile attacks followed by epistaxis, and for one year from progressive enlargement of the spleen. Blood examination: White cells, 190,000; hæmoglobin 55 per cent.; red cells, 3,600,000. Differential count: mononuclears, large and small, 50 per cent.; polymorphs, 32 per cent.; transitionals, 17 per cent. Surgical interference was deemed unsuitable, and fifteen applications of X-ray treatment were given, one every six days. The spleen diminished to a third of its former size, and the blood-count was as follows: white cells, 28,080; red cells, 3,908,000; hæmoglobin, 80 per cent. Differential count: polymorphs, 77 per cent.; lymphocytes, 15 per cent.; transitionals, 7 per cent.

J. D. ROLLESTON.

A case of hæmophilia treated with repeated injections of blood-serum (*'Journ. Amer. Med. Assoc.,'* 1913, lxi, p. 121).—**F. E. Clough** reports the case of a girl, aged 14 years, who had a negative family history relative to hæmophilia. No history of hæmophilia developed in this case until the patient reached the age of eleven. At that time she had her tonsils and some adenoids removed. Following this operation there was profuse bleeding from the back of the pharynx that almost exsanguinated the patient. Five days later bleeding again occurred from the same site. One year after this she started to menstruate, the first period lasting two weeks. The twenty-eight-day type was at once assumed, the flow lasting for ten or fifteen days. At first she was kept in bed, given ergot, stypticin, calcium chloride, gelatin and various other drugs without in any way influencing the course of the disease. Finally she was given 30 c.c. of horse-serum, with very favourable results. For the following three months the period lasted but three days each time. The next month she was sick for two weeks. Since that time she has had three injections of blood-serum obtained from her mother, each one being able to control the situation for three or four months. It is now four months since the last dose was given and her last period was prolonged for eighteen days. She will be given another injection this month. Whether it will be necessary to continue these injections remains to be seen.

T. R. WHIPHAM.

Treatment of hæmorrhagic disorders (*Journ. Amer. Med. Assoc.*, 1913, LXI, p. 1277).—**T. B. Cooley** is of opinion that blood therapy of some kind is the best remedy for hæmorrhagic conditions. In hæmophilia blood-serum seems to have a specific action so far as checking the hæmorrhage is concerned. It may be used as a prophylactic measure, as well as to stop existing hæmorrhage. Fresh human serum is probably to be preferred. In purpura, melæna, and other toxic conditions, in which various blood elements have been shown to be lacking, none of the serums are always effective, and there are good theoretical and clinical reasons for believing that whole blood should be preferred, not only to stop hæmorrhage, but for a possible curative effect on the underlying disease condition. Transfusion is not really a difficult procedure. It is deserving of extended trial—not as a last resort, but as the first treatment in any of the hæmorrhage diseases of toxic nature.

T. R. WHIPHAM.

The “specific” use of salicylate in acute rheumatism (*Quart. Journ. Med.*, 1913, VI, p. 519).—**Reginald Miller** defines this as the use founded upon the assumption that salicylate has the power of diminishing the activity of the rheumatic infection. The article is not concerned with the truth of this conception, but with certain practical objections which have been raised against it. These are examined in the light of an analysis of a series of 124 rheumatic children under the care of Dr. D. B. Lees and all treated by salicylate. The following conclusions are reached: (1) That increasing the dose of salicylate does not imply increased absorption is disproved by analysing the urine of a series of cases under salicylate treatment. (2) That large doses are too prone to produce vomiting to be useful is only partially correct. More important factors in the production of vomiting are the method of administration and the type of case under treatment. Dilatation of the heart particularly predisposes to troublesome vomiting under salicylate, and this must be one limitation to the “specific” use of the drug in rheumatic carditis. (3) That acid intoxication is more the result of the method of administration than the size of the dose employed. (4) That in the series examined no death could be attributed to the dose employed. The largest dose used in any fatal case was 120 gr. daily. (5) That relapses are not so frequent in cases freely treated as in those in which small doses are employed. Nodule-formation is not a more frequent form of relapse than arthritis. Where nodules develop under large doses of salicylate they seem to signify little, if any, renewed general activity on the part of the infection.

AUTHOR'S ABSTRACT.

Scope of salicylate in the treatment of acute rheumatism (*Clin. Journ.*, 1913, XLII, p. 140).—**Reginald Miller** regards the anti-rheumatic action of salicylate as limited to diminishing the activity of the rheumatic infection, and does not think it capable of altering toxic parenchymatous changes except by tending to destroy the origin of the toxin. Thus salicylate is at its best where the symptoms are chiefly due to bacterial activity, as in arthritis; and is at a disadvantage where the symptoms are largely due to toxic changes. For these reasons large arthritic effusions, pericardial and pleural effusions, chronic (afebrile) chorea, myocardial degeneration are beyond the direct scope of the drug. In addition, in rheumatic heart-disease there is another limitation to the anti-rheumatic action of salicylate, namely, that it is where the heart is severely damaged,

particularly where it is much dilated, that salicylate is prone to produce vomiting. Thus the drug does not here get a good chance of combating what bacterial activity may be present.

AUTHOR'S ABSTRACT.

Reviews.

ORTHOPÆDICS IN MEDICAL PRACTICE. By Prof. ADOLF LORENZ and Dr. ALFRED SAXL. Translated by L. C. PEEL RITCHIE, Ch.M., M.D., F.R.C.S.Edin. London: John Bale, Sons & Danielsson, Ltd., 1913. Price 7s. 6d. net.

IN the presentation of such a large subject as orthopædics within the limits of 263 quarto pages, the authors of 'Orthopædics in Medical Practice' have cleverly omitted nearly all the usual features by which we recognise volumes dealing with this subject. A preliminary glance through the book assured us of this—perhaps it would be more accurate to say reassured us of this. The usual discussion as to the pathology of infantile palsy or infantile diplegia, ending in a hopeless attempt to reconcile opposing theories, was lacking; missing, too, were the usual illustrations of club-foot. It was, therefore, with a pleasant anticipation of interest that we settled down to see what two such masters have to say upon their subject, nor were we disappointed.

Orthopædics is here dealt with wholly from its clinical aspect—the effect which all abnormalities and deformities have upon the different systems of the body.

Chapters I to IV deal successively with the respiratory, circulatory, digestive and urinary systems, and are perhaps the most interesting in the book, as they deal with the subject in a manner wholly out of the common. For instance, take scoliosis, or "skoliosis," as the translator prefers to keep it. You might think that in a book with "orthopædics" for its title, the pathology, ætiology and treatment of the condition would have to be stolidly plodded through. Not at all; not a word about any of them. The authors pay you the compliment of supposing that you have already had a medical education. They deal, however, with the effect scoliosis has upon the different systems of the body in predisposing them to disease and its influence on the course and prognosis of such affections.

Chapter V is the longest, as it deals with the whole of the nervous system. It is divided conveniently into headings—peripheral nerves, spinal cord, brain and neuroses. The remaining chapter is on the locomotor system and includes the different forms and effects of arthritis. All the chapters are full of original observations and suggestive deductions, and fully repay the reading.

As in all faithful translations of German works, however, the reading is rendered unnecessarily wearisome by the constant use of persons' names placed after simple statements of fact, which the reader would be quite willing to accept. We are willing to believe, also, that certain German children may be "gibbose" and even possess "gibbosities," but we see no necessity to use these as clinical terms in English; hump-back is a term we all understand. German children can apparently pronate and supinate their feet both with facility and precision, but our own opinion is that English children as yet can only evert and invert them to a limited extent, and the

use of the former terms is not only unnecessary, but puzzling. Dr. Peel Ritchie will understand these remonstrances, and can be assured that we appreciate the fact that he has struggled against and overcome all the other pitfalls which await the feet of a translator, and has presented in a most acceptable form a book of exceptional interest.

D. C. L. F.

THE TUBERCULOSIS YEAR-BOOK AND SANATORIA ANNUAL. Edited by T. N. KELYNACK, M.D. Vol. i. London: John Bale, Sons & Danielsson, Ltd. Price 7s. 6d. net.

THIS is a valuable addition to the literature of tuberculosis. It contains a description of nearly all the sanatoria, chest hospitals and dispensaries with many excellent drawings of the various institutions. A list of all the tuberculosis officers in the British Isles is given, as well as a catalogue of the books on the subject published during the year and a description of the methods carried out throughout the British Isles and in English-speaking countries for combating the disease. In addition, there are numerous articles by various writers on different aspects of tuberculosis. Mention must also be made of the drawings of shelters both for rich and poor. The whole book is an invaluable work of reference, and should be in the possession of every medical officer of health and authority which has to deal with tuberculosis. This is the first year of its publication, and we congratulate the editor on its production and wish the work a prosperous career.

F. R. B. A.

CHAVASSE'S ADVICE TO A MOTHER ON THE MANAGEMENT OF HER CHILDREN. Revised by THOMAS DAVID LISTER, M.D. London, Physician, Royal Waterloo Hospital for Children and Women, Physician to the Mount Vernon Hospital for Consumption and Diseases of the Chest, etc. London: J. & A. Churchill, 7, Great Marlborough Street, W. Price 1s. 6d. net.

THIS well-known publication has now reached its seventeenth edition—a fact which affords ample evidence of its continued popularity. The volume is divided into three sections, which deal respectively with infancy, childhood, and boyhood and girlhood. While the general scope of the work has remained much the same as in earlier editions, modern requirements have necessitated some re-arrangement of the matter and the re-writing of certain parts. The mother who takes an intelligent interest in the health and happiness of her children will be able to glean much valuable information on the management of children and on the treatment of various emergencies and accidents. The subject of infant feeding is very well discussed in a practical manner. Perhaps the symptomatology of diseases has been too fully dealt with, for it might lead to some parents trying to diagnose and treat their children's ailments, with regrettable results. The book is, however, one of the best of its kind and deserves a wide circulation.

J. A.

BOOK FOR MOTHERS ON THE MANAGEMENT OF CHILDREN IN HEALTH AND IN DISEASE. By Mrs. A. M. USHER. Pp. 106. J. and A. Churchill, 7, Great Marlborough St., London, 1913. Price 1s.

THIS is a cheap shilling's-worth and contains everything clearly and succinctly written that a mother should know regarding the care of her children from the earliest years and onwards. Most of it is, of course, to be found in other works of its kind, but we can heartily recommend this little unpretentious work to all who have or are about to have the care of children.

F. R. B. A.